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January 18, 2018

Reference No. 003978

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Dear Ms. Bianchin and Ms. Willkom:

**Re: EW1 Shutdown Pilot Study Addendum
Wausau Water Supply Superfund Site
Wausau, Wisconsin**

At the request of the United States Environmental Protection Agency (EPA) and the Wisconsin Department of Natural Resources (WDNR), this letter provides additional groundwater data that have been collected since the EW1 Shutdown Pilot Study Report was submitted in March 2015. These data were collected during the annual monitoring events conducted in the fall of 2015, 2016, and 2017.

Review of these data indicate that concentration trends of volatile organic compounds (VOCs) have changed near the West Bank source area, but that all impacted groundwater is contained and captured by the two City of Wausau remediation wells, CW3 and CW6.

The Site location is shown on Figure 1 and a Site Plan, including monitoring well locations, is presented as Figure 2.

1. Background

The EW1 Shutdown Pilot Study occurred over five quarters from the fall of 2013 through the fall of 2014. The monitoring was conducted in accordance with the approved schedule presented in the EW1 Shutdown Pilot Study Work Plan. The results of the first four monitoring events were presented in quarterly reports submitted to EPA and WDNR. The results of the fourth quarter 2014 monitoring, and the pilot study conclusions were presented in the combined "2014 Annual Monitoring Report and EW-1 Shutdown Pilot Study Report", (CRA, 2015). Based on the conclusions presented in the 2015 report, permanent shutdown of EW1 was requested.

2. Groundwater Data Collection Since March 2015

Additional Site groundwater data were collected during the annual groundwater monitoring events conducted each year in the fall. The fall 2015 and fall 2016 data were reported previously in the annual monitoring reports, which were submitted in March 2016 and April 2017, respectively. The fall 2017 monitoring data will be submitted in February 2018, but is also summarized in this addendum.



In addition, in groundwater samples were collected from temporary wells during the recent vapor intrusion evaluation on the East Bank and West Bank. These data are also summarized in this addendum. The Site Plan, Figure 1, shows the locations of all Site monitoring wells.

Fall 2015 Data

The fall 2015 annual monitoring event consisted of groundwater sampling of 22 monitoring wells, three City supply wells, and EW1. At the request of EPA, an additional seven monitoring wells were sampled to further assess potential effects related to the shutdown of EW1. These wells were: R1D, W50, WC4, WC7, E26, E26A, and E28A. Also, as a preliminary step for the evaluation of potential vapor intrusion, sampling of eight shallow aquifer monitoring wells was requested by EPA. These wells were: C3S, C6S, C7S, R2S, MW4B, MW7, W55A, and W57. Water levels were measured at all Site monitoring wells.

The analytical results for fall 2015 sampling are summarized in Tables 1A and 1B. None of the reported results for fall 2015 sampling indicated a significant change in the West Bank contaminant plume. The results for the seven additional wells related to the shutdown of EW1 were mostly “non-detect”. Chloroform was detected at two locations and trichloroethene (TCE) was detected at one location, but the concentrations were all less than 0.5 µg/L.

Groundwater contours for water level measurements collected during the fall 2015 monitoring event are presented in Attachment 1. The contours show that the West Bank contaminant plume is within the groundwater containment areas created by the pumping of CW3 and CW6.

Fall 2016 Data

The fall 2016 annual monitoring event consisted of groundwater sampling of 23 monitoring wells, two City supply wells, and EW1. At the request of EPA, two additional monitoring wells, WWSWS and W52A, were sampled to further assess potential effects related to the shutdown of EW1. Water levels were measured at all Site monitoring wells.

The analytical results for fall 2016 sampling are summarized in Table 2. None of the reported results for fall 2016 sampling indicated a significant change in the West Bank contaminant plume. The results for the two additional wells related to the shutdown of EW1 were “non-detect”.

Groundwater contours for water level measurements collected during the fall 2016 monitoring event are presented in Attachment 1. The contours show that the West Bank contaminant plume is within the groundwater containment areas created by the pumping of CW3 and CW6.

Fall 2017 Data

The fall 2017 annual monitoring event consisted of groundwater sampling of 21 monitoring wells, two City supply wells, and EW1. At the request of EPA, three additional monitoring wells, C3S, C7S, and R1D, were sampled to further assess potential effects related to the shutdown of EW1. Water levels were measured at all Site monitoring wells.

The analytical results for fall 2017 sampling are summarized in Table 3. None of the reported results for fall 2017 sampling indicated a significant change in the West Bank contaminant plume. With regard to the



sample results for the three additional wells, TCE was detected at C7S with a concentration of 10 µg/L, which is consistent with previous results. CW7 is directly downgradient from the West Bank source area. C3S, which is screened in the West Bank source area, exhibited elevated concentrations of carbon tetrachloride and chloroform. The carbon tetrachloride concentration was 150 µg/L, which exceeded the EPA maximum contaminant level (MCL) of 5 µg/L. No VOCs were detected in the sample from R1D.

City supply well CW3 was not operating during the fall 2017 monitoring event, thus groundwater contours for normal operating conditions are not available. The contours shown in Attachment 1, for 2015 and 2016 monitoring are representative of the contours under typical pumping scenarios.

West Bank Temporary Monitoring Well Data

As part of the vapor intrusion evaluation, groundwater samples were collected from seven temporary wells on the West Bank to better delineate the contaminant plume in the shallow portion of the aquifer. Sampling was conducted on March 8 and 9, 2017 and each sample was analyzed for West Bank-specific VOCs -- TCE, cis-1,2-dichloroethene (c12DCE), vinyl chloride, carbon tetrachloride, and chloroform. Temporary well locations are shown on Figure 3 and laboratory results are summarized in Table 4.

All sample results were non-detect or nearly non-detect and none of the reported concentrations exceeded its MCL or DNR Enforcement Standard (ES). TCE was detected with a concentration of 1.0 µg/L at W2, on the Marathon Electric site, and chloroform was detected with a concentration of 2.1 µg/L at W4, which is immediately downgradient of the Marathon Electric site.

3. 2015 through 2017 Groundwater Data Summary

Since the EW1 Shutdown Pilot Study Report was submitted in March 2015, three rounds of groundwater monitoring were conducted in the fall of each year and shallow aquifer samples were collected from seven temporary wells in the spring of 2017.

West Bank Source Area Monitoring Wells

Graphs showing total chlorinated VOC (TCVOC) concentration trends over time are presented in Attachment 2. Graphs for source area wells W53A, W54, and WSWD show that increased concentrations occurred at most source area monitoring wells for approximately one year after EW1 stopped operating in July 2012. Since November 2014, source area VOC concentrations decreased to concentrations closer to pre-shut-down levels. The exception is W53A where concentrations increased for about 18 months after EW1 shut-down, then decreased to pre-shut-down levels over the next 18 months before increasing again from 2015 to October 2017. The changes in the source area VOC concentrations may be attributed to a combination of several factors, including,

- Changes in the groundwater flow direction
- Decreased groundwater flux through the source area due to a shallower flow gradient after EW1 shut-down
- A higher water table could cause the groundwater to contact source material that was previously above the water table



- Highly variable amounts of precipitation with associated variability in the amount of leachate created

West Bank Downgradient Monitoring Wells

VOC concentrations in the monitoring wells between the source area and CW6 would be expected to increase slightly since EW1 is no longer capturing all of the groundwater near the source area. Review of the graphs for these wells (Attachment 2 - W52, R2D, C2S, W55) indicates that concentrations are generally higher, but not significantly higher. More recent concentrations for R2D, R3D, and W55 suggest that the plume remnant that was in the stagnation area near R3D is migrating north toward CW6, as expected.

Typically, TCE is the only VOC detected at City well CW6. Concentrations at CW6 remain low and have not exceeded the MCL for TCE since 2009 (see graph in Attachment 2). VOC concentrations at CW3 on the East Bank have been below the MCL since 2008. Thus, the influent concentrations for both remediation wells, CW3 and CW6, are below the drinking water criteria prior to the air stripping, blending, and clarifying performed by the City treatment plant.

4. Updated Pilot Study Conclusions

The Pilot Study was designed to provide data to detect or confirm aquifer conditions in six principal areas:

1. **Plume Containment:** The most critical data relative to the permanent shutdown of EW1 is that the City remediation wells continue to contain and remove the remaining contaminants in the groundwater. Water level data collected since EW1 was shut down in mid-2012, indicate that the VOC plumes on both sides of the river are contained by the pumping of the City water supply/remediation wells CW6 and CW3. The five quarters of water level data collected during the pilot study, and the annual monitoring conducted in 2015, 2016, and 2017, confirm that the capture zones created by the City wells are consistent and effective at containment and removal of the contaminant plumes. Groundwater contour figures for each quarter during the pilot study, plus fall 2015 and 2016 contours, are provided in Attachment 1.
2. **No Groundwater Receptors:** No private wells have been identified in the area of groundwater contamination and there are City ordinances that will prevent the installation of wells in the areas near the Superfund Site.
3. **Safe City Water Supply:** Groundwater pumped by the municipal wells is treated by air stripping and is also blended with un-impacted groundwater to ensure a safe water supply. Influent concentrations at CW3 and CW6 (prior to treatment) are below the Wisconsin and Federal drinking water standards. In addition to the groundwater monitoring conducted for the Superfund Site, the City monitors the post-treatment water supply by performing quarterly sampling and analyses.
4. **Remediation of R3D Stagnation Area:** The aquifer in the R3D area was near the flow divide between EW1 and CW6. Thus, aquifer flushing of VOCs in the R3D area had been slower than other areas because this area was in a stagnation zone. Data collected from R2D, R3D, R4D, W52, and W55 over the last four years are consistent with plume migration to the north toward



CW6. VOC concentrations declined at R3D, increased and then declined at R2D, and are slowly increasing at W55.

Groundwater elevations and contours, as shown on the drawings in Attachment 1, suggest that the flow divide between CW6 and CW3 is south of R3D in the approximate area of R4D, which is approximately 500 to 700 feet south from where the flow divide was when EW1 was operating. Thus, groundwater north of the R4D area is within the capture zone of CW6 and will flow north to CW6 where it will be removed and treated

5. **Continued Remediation of EW1 Area:** As illustrated on the groundwater contour figures presented in Attachment 1, the West Bank aquifer south of EW1 appears to be within the capture zone of CW3. Groundwater flow from this area will likely be to the east-southeast beneath the river and eventually to CW3 where it will be removed and subsequently treated by the City water treatment plant. Groundwater in the EW1 area is near the flow divide between CW3 and CW6. If it is not captured by CW3, it will be captured by CW6, thus, it will be captured and treated regardless of the exact flow divide location.

In the vicinity of the West Bank source area, CVOCs are more prevalent in the shallower portion of the aquifer. W53A is in the old landfill source area and TCE concentrations have fluctuated up and down since the shutdown of EW1 and concentrations at W54 increased sharply, then decreased sharply over the last five years. As explained in Section 3 above, there are multiple possible explanations for these fluctuations, including a change in groundwater flow direction from northeast to east toward CW3.

Total CVOC concentrations at C2S were below 5 µg/L from 2002 through 2012. However, concentrations increased to levels that are slightly greater than 5 µg/L after EW1 stopped operating. This may be a temporary increase, but it suggests that a portion of the impacted groundwater from the old landfill source area is migrating north to CW6. Prior to the shutdown of EW1, this portion of the groundwater plume would have been captured by EW1.

Monitoring wells IWD and E21 were sampled during the pilot study to monitor potential increases in CVOC concentrations due to West Bank plume migration beneath the river toward CW3. No concentration increases were observed at either location. The island well, IWD, was last sampled in November 2014. TCE and c12DCE were detected, but the concentrations were less than the State and Federal drinking water standards. Monitoring well E21 has been sampled annually as part of the long-term monitoring program and all results have been “non-detect”.

6. **Continued Remediation of East Bank Plume:** The shutdown of EW1 does not impact the continued remediation of the East Bank plume. Groundwater flow patterns on the East Bank are controlled by the pumping of CW3 and the East Bank plume is completely within the capture area of CW3.

5. Summary

EW1 was installed in 1990 to contain and remove the high VOC concentrations near the West Bank source area. This has been accomplished as concentrations have been reduced from thousands of parts



per billion to tens of ppb, or less. By 2006, VOC concentrations at EW1 had become asymptotic with TCVOC concentrations less than 10 µg/L (see the EW1 chart in Attachment 2). Operation of EW1 had continued because VOC concentrations at certain monitoring wells in or near the source area continued to exceed the cleanup standards.

EW1 has accomplished its performance goal, which was to prevent the migration of high concentrations of VOCs in the source area groundwater to the West Well Field. Given that the current groundwater VOC concentrations near the former source area are much lower, and that EW1 lies within the capture area of the two City remediation wells, continued operation of EW1 is not critical relative to the protection of potential groundwater receptors.

Through a combination of more than 20 years of groundwater remediation, source area remediation, institutional controls, and continued hydraulic control and treatment of the remaining plume by CW6 and CW3, the shut down EW1 does not create additional exposure risk to human health or the environment.

To summarize:

1. The potential for higher VOC concentrations to migrate from west side source areas to the West Well Field has been eliminated by more than 20 years of EW1 operation and SVE remediation of the former municipal landfill.
2. City Treatment Plant sample results do not indicate potential impact due to contaminated groundwater. VOC concentrations in the CW3 and CW6 influent samples are below drinking water standards. The west side plume is captured by CW6 and CW3. CW6 creates a hydraulic barrier to protect the other West Well Field supply wells.
3. Institutional controls maintained by the City of Wausau restrict the installation of private wells and can require abandonment of existing wells, although well surveys indicate that there are no private wells near the Site.

Thus, the continued operation and associated expense of EW1 is no longer necessary and permanent shut down of EW1 is requested.

If you have any additional questions, please contact me at (651) 639-0913.

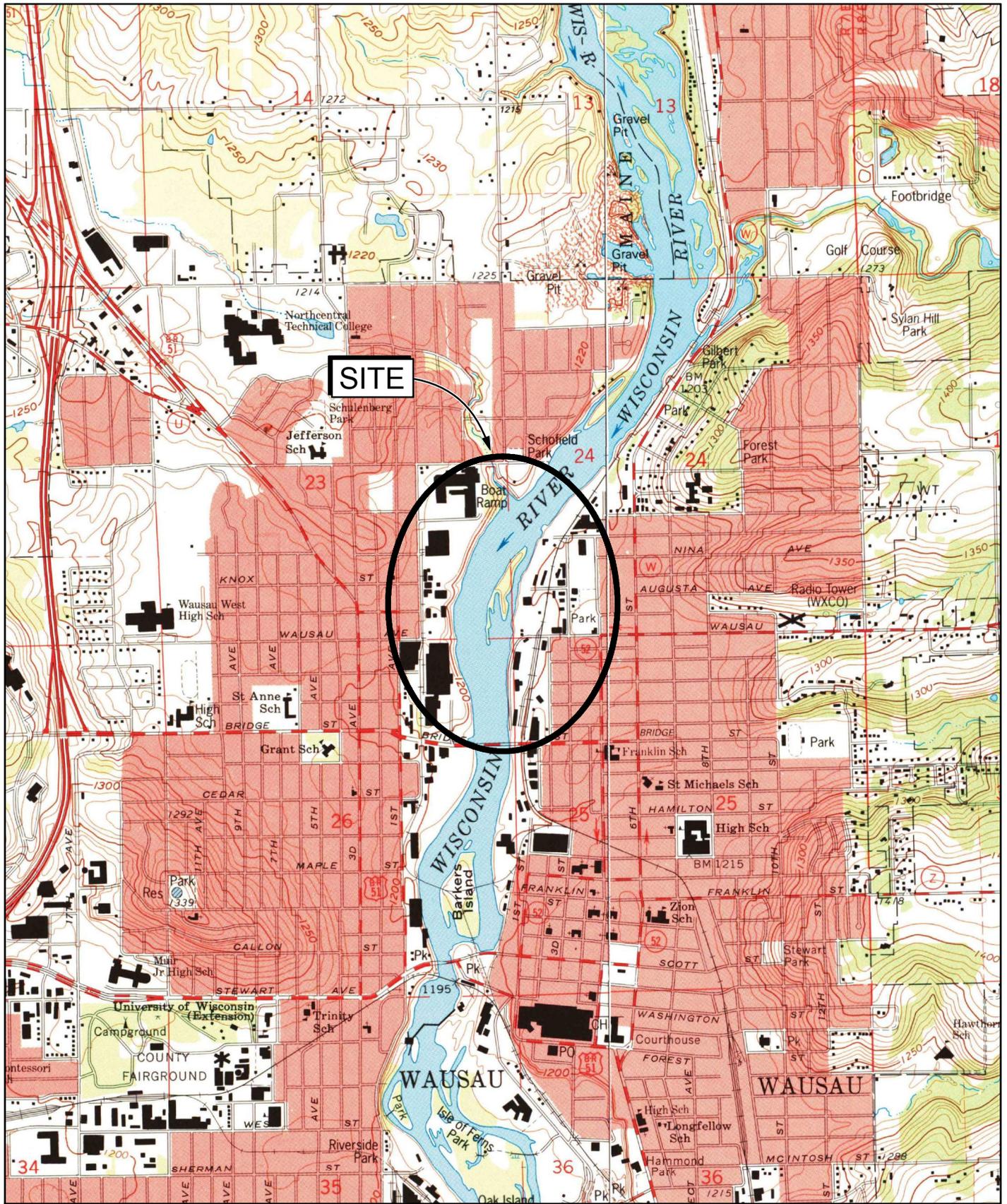
Sincerely,

GHD

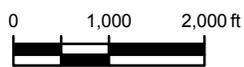
Chuck Ahrens

CA/sb/38

Encl.



Source: USGS 7.5 Minute Quads - Wausau East; Wausau West

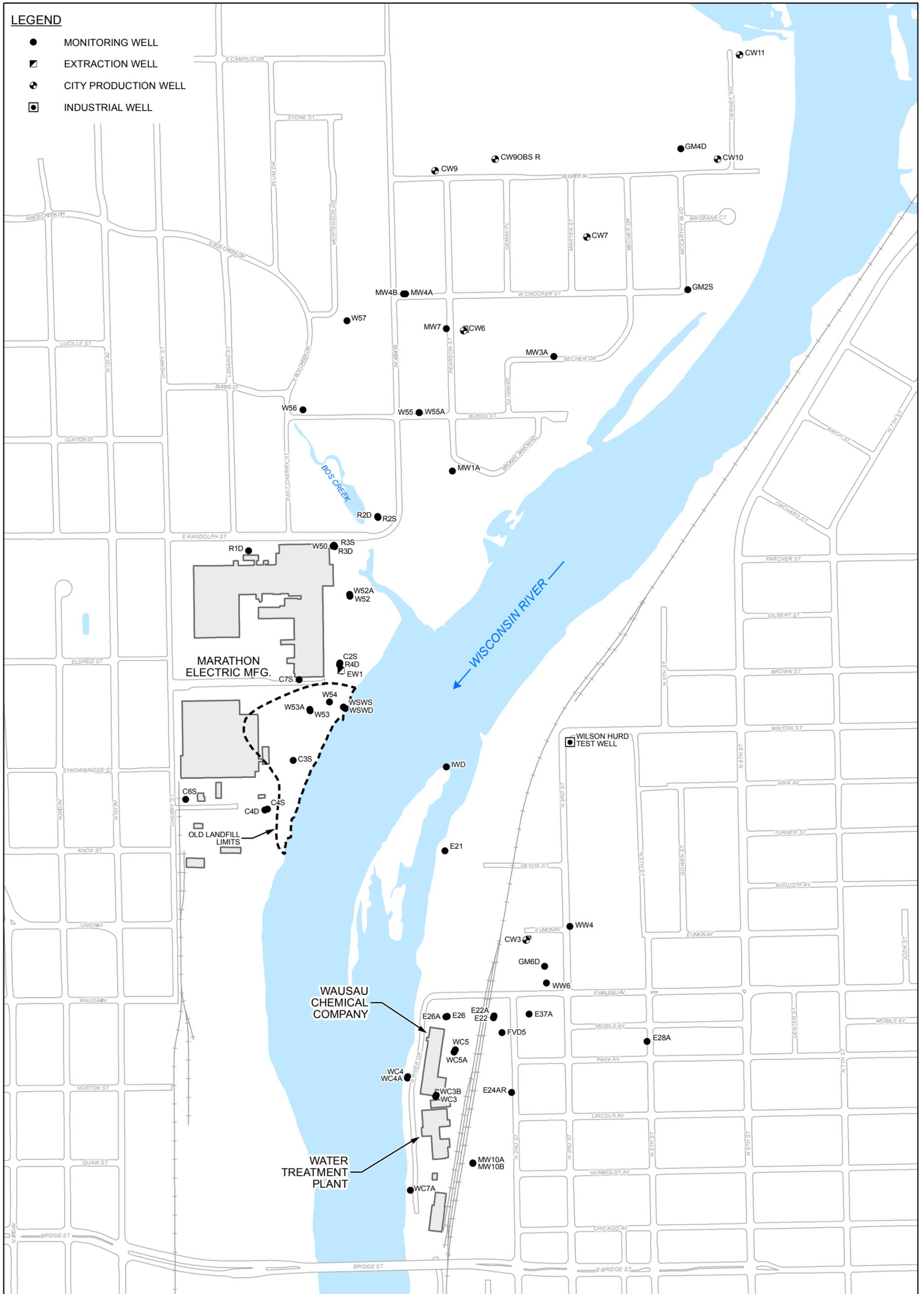


WAUSAU WATER SUPPLY NPL SITE
 WAUSAU, WISCONSIN
 EWI SHUT-DOWN PILOT STUDY ADDENDUM

003978-00
 Jan 18, 2018

SITE LOCATION

FIGURE 1



Source: Marathon County

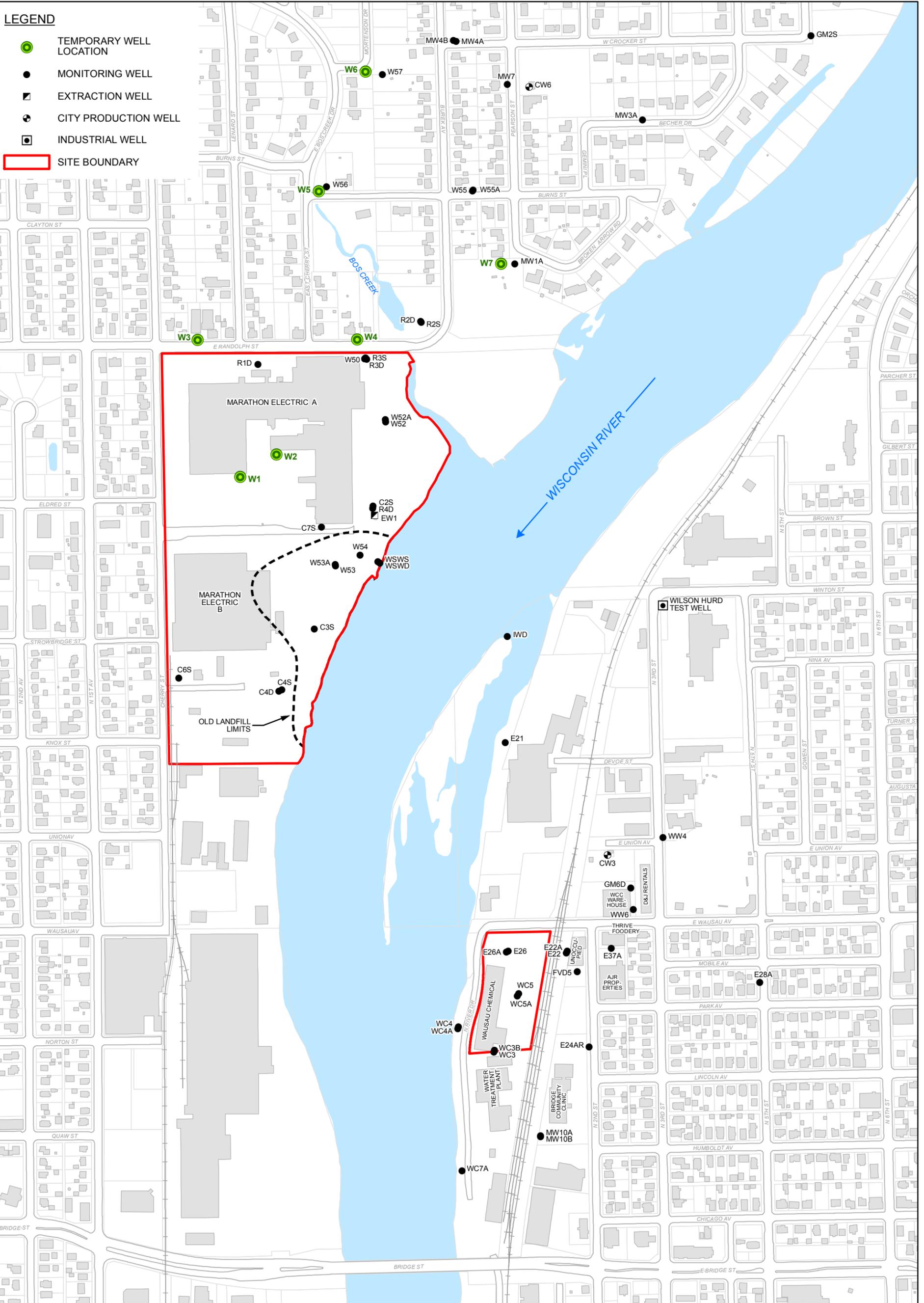


WAUSAU WATER SUPPLY NPL SITE
 WAUSAU, WISCONSIN
 EWI SHUT-DOWN PILOT STUDY ADDENDUM

SITE PLAN

003978-00
 Jan 18, 2018

FIGURE 2



Source: Marathon County



WAUSAU WATER SUPPLY NPL SITE
 WAUSAU, WISCONSIN
 EWI SHUT-DOWN PILOT STUDY ADDENDUM
 WEST BANK SHALLOW AQUIFER
 DELINEATION LOCATIONS

003978-00
 Jan 18, 2018

FIGURE 3

**Annual Groundwater Monitoring
Volatile Organic Compounds Analytical Results - October 2015
Wausau Water Supply NPL Site
Wausau, Wisconsin**

Sample Location:			CW6	CW10	EW1	C2S	C4S	MW1A
Sample ID:	Cleanup		W-151013-OJ-15	W-151013-OJ-16	W-151013-OJ-18	W-151013-OJ-19	W-151013-OJ-17	W-151013-OJ-30
Sample Date:	Standard		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Location	or MCL		West Bank					
1,1,2-Trichloroethane		ug/L	1.0 U					
1,1-Dichloroethene		ug/L	1.0 U					
Acetone		ug/L	10 U					
Benzene	5	ug/L	1.0 U					
Carbon tetrachloride	5	ug/L	1.0 U					
Chloroform		ug/L	1.0 U	1.0 U	1.0 U	1.0 U	0.36 J	1.0 U
cis-1,2-Dichloroethene	70	ug/L	1.0 U	1.0 U	1.0 U	0.50 J	1.0 U	1.0 U
Ethylbenzene	700	ug/L	1.0 U					
Methylene chloride		ug/L	1.0 U					
Tetrachloroethene	5	ug/L	1.0 U					
Toluene	1000	ug/L	1.0 U					
Trichloroethene	5	ug/L	2.4	0.62 J	1.0 U	4.7	3.2	1.0 U
Vinyl chloride	2	ug/L	1.0 U					
Xylenes (total)	10,000	ug/L	1.0 U					

**Annual Groundwater Monitoring
Volatile Organic Compounds Analytical Results - October 2015
Wausau Water Supply NPL Site
Wausau, Wisconsin**

Sample Location:			R3D	R4D	R2D	W56	W52	W53A
Sample ID:	Cleanup		W-151013-OJ-20	W-151013-OJ-26	W-151014-OJ-33	W-151013-OJ-28	W-151013-OJ-21	W-151013-OJ-24
Sample Date:	Standard		10/13/2015	10/13/2015	10/14/2015	10/13/2015	10/13/2015	10/13/2015
Location	or MCL		West Bank					
1,1,2-Trichloroethane		ug/L	1.0 U					
1,1-Dichloroethene		ug/L	1.0 U					
Acetone		ug/L	10 U					
Benzene	5	ug/L	1.0 U					
Carbon tetrachloride	5	ug/L	1.0 U					
Chloroform		ug/L	1.0 U					
cis-1,2-Dichloroethene	70	ug/L	1.0 U	0.27 J	1.6	1.0 U	4.7	1.0 U
Ethylbenzene	700	ug/L	1.0 U					
Methylene chloride		ug/L	1.0 U					
Tetrachloroethene	5	ug/L	1.0 U					
Toluene	1000	ug/L	1.0 U					
Trichloroethene	5	ug/L	1.8	3	32	1.0 U	26	16
Vinyl chloride	2	ug/L	1.0 U					
Xylenes (total)	10,000	ug/L	1.0 U					

**Annual Groundwater Monitoring
Volatile Organic Compounds Analytical Results - October 2015
Wausau Water Supply NPL Site
Wausau, Wisconsin**

Sample Location:			W53A FD	W54	W55	WSWD	WW4	WW6
Sample ID:	Cleanup		W-151013-OJ-25	W-151013-OJ-23	W-151013-OJ-29	W-151112-OJ-16	W-151012-OJ-11	W-151012-OJ-10
Sample Date:	Standard		10/13/2015	10/13/2015	10/13/2015	11/12/2015	10/12/2015	10/12/2015
Location	or MCL		West Bank	West Bank	West Bank	West Bank	East Bank	East Bank
1,1,2-Trichloroethane		ug/L	1.0 U	1.4 U				
1,1-Dichloroethene		ug/L	1.0 U	1.4 U				
Acetone		ug/L	10 U	14 U				
Benzene	5	ug/L	1.0 U	1.4 U				
Carbon tetrachloride	5	ug/L	1.0 U	1.4 U				
Chloroform		ug/L	1.0 U	1.0 U	1.0 U	1.0 U	0.55 J	1.4 U
cis-1,2-Dichloroethene	70	ug/L	1.0 U	0.43 J	1	0.32 J	1.0 U	45
Ethylbenzene	700	ug/L	1.0 U	1.4 U				
Methylene chloride		ug/L	1.0 U	1.4 U				
Tetrachloroethene	5	ug/L	1.0 U	7.4				
Toluene	1000	ug/L	1.0 U	1.4 U				
Trichloroethene	5	ug/L	16	35 J	6.8	3.2	1.0 U	6.8
Vinyl chloride	2	ug/L	1.0 U	8.4				
Xylenes (total)	10,000	ug/L	1.0 U	1.4 U				

**Annual Groundwater Monitoring
Volatile Organic Compounds Analytical Results - October 2015
Wausau Water Supply NPL Site
Wausau, Wisconsin**

Sample Location:			WC5A	WC5A FD	WC3B	CW3	E21	E22A
Sample ID:	Cleanup		W-151012-OJ-12	W-151012-OJ-13	W-151012-OJ-14	W-151012-OJ-05	W-151012-OJ-08	W-151012-OJ-09
Sample Date:	Standard		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Location	or MCL		East Bank					
1,1,2-Trichloroethane		ug/L	1.0 U					
1,1-Dichloroethene		ug/L	1.0 U					
Acetone		ug/L	10 U					
Benzene	5	ug/L	1.0 U					
Carbon tetrachloride	5	ug/L	1.0 U					
Chloroform		ug/L	1.0 U					
cis-1,2-Dichloroethene	70	ug/L	0.94 J	0.79 J	1.0 U	0.87 J	1.0 U	1.6
Ethylbenzene	700	ug/L	1.0 U					
Methylene chloride		ug/L	1.0 U					
Tetrachloroethene	5	ug/L	10	10	2.4	1.5	1.0 U	6.1
Toluene	1000	ug/L	1.0 U					
Trichloroethene	5	ug/L	0.76 J	0.82 J	1.0 U	0.78 J	1.0 U	0.33 J
Vinyl chloride	2	ug/L	0.34 J	0.30 J	0.46 J	1.0 U	1.0 U	1.0 U
Xylenes (total)	10,000	ug/L	1.0 U					

**Annual Groundwater Monitoring
Volatile Organic Compounds Analytical Results - October 2015
Wausau Water Supply NPL Site
Wausau, Wisconsin**

Sample Location: Sample ID: Sample Date: Location	Cleanup Standard or MCL		E24AR	E37A	MW10A	MW10B
			W-151012-OJ-03 10/12/2015 East Bank	W-151012-OJ-06 10/12/2015 East Bank	W-151012-OJ-02 10/12/2015 East Bank	W-151012-OJ-01 10/12/2015 East Bank
1,1,2-Trichloroethane		ug/L	2.5 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene		ug/L	2.5 U	1.0 U	1.0 U	1.0 U
Acetone		ug/L	25 U	10 U	10 U	10 U
Benzene	5	ug/L	2.5 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	ug/L	2.5 U	1.0 U	1.0 U	1.0 U
Chloroform		ug/L	2.5 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	ug/L	61	0.69 J	1.0 U	1.0 U
Ethylbenzene	700	ug/L	2.5 U	1.0 U	1.0 U	1.0 U
Methylene chloride		ug/L	2.5 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	ug/L	61	0.59 J	1.0 U	1.0 U
Toluene	1000	ug/L	2.5 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	ug/L	8.8	0.33 J	1.0 U	1.0 U
Vinyl chloride	2	ug/L	6	1.0 U	1.0 U	1.0 U
Xylenes (total)	10,000	ug/L	2.5 U	1.0 U	1.0 U	1.0 U

Notes:

- U - Not detected at the associated reporting limit
- J - Estimated concentration
- FD - Field duplicate
- shaded cells indicate concentration exceeds MCL

Additional Groundwater Data for EW1 Shutdown Evaluation - November 2015
Wausau Water Supply NPL Site
Wausau, Wisconsin

Sample Location:		W50	R1D	WC4	WC7	WC7 FD	E26	E26A	E28A
Sample ID:		W-151112-OJ-17	W-151112-OJ-12	W-151112-OJ-03	W-151112-OJ-04	W-151112-OJ-05	W-151112-OJ-02	W-151112-OJ-01	W-151112-OJ-07
Sample Date:		11/12/2015	11/12/2015	11/12/2015	11/12/2015	11/12/2015	11/12/2015	11/12/2015	11/12/2015
Location		West Bank	West Bank	East Bank					
1,1,2-Trichloroethane	ug/L	1.0 U	1.0 U	1.0 U	ND (1.0) R	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	ND (1.0) R	1.0 U	1.0 U	1.0 U	1.0 U
Acetone	ug/L	10 U	10 U	10 U	ND (10) R	10 U	10 U	10 U	10 U
Benzene	ug/L	1.0 U	1.0 U	1.0 U	ND (1.0) R	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	ug/L	1.0 U	1.0 U	1.0 U	ND (1.0) R	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	ug/L	1.0 U	0.44 J	1.0 U	ND (1.0) R	1.0 U	1.0 U	1.0 U	0.28 J
cis-1,2-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	ND (1.0) R	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	ug/L	1.0 U	1.0 U	1.0 U	ND (1.0) R	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	ug/L	1.0 U	1.0 U	1.0 U	ND (1.0) R	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	ug/L	1.0 U	1.0 U	1.0 U	ND (1.0) R	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	ug/L	1.0 U	1.0 U	1.0 U	ND (1.0) R	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	ug/L	1.0 U	1.0 U	1.0 U	ND (1.0) R	1.0 U	0.47 J	1.0 U	1.0 U
Vinyl chloride	ug/L	1.0 U	1.0 U	1.0 U	ND (1.0) R	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	ug/L	1.0 U	1.0 U	1.0 U	ND (1.0) R	1.0 U	1.0 U	1.0 U	1.0 U

Notes:

- U - Not detected at the associated reporting limit
- J - Estimated concentration
- FD - Field duplicate
- R - WC7 data were rejected due to sample pH greater than 2. However, WC7 duplicate sample results are valid.

Table 2

**Groundwater Sampling Analytical Results - October 2016
Wausau Water Supply NPL Site
Wausau, Wisconsin**

	Location ID:	W52	W53A	W54	W55	W56	R2D	R3D
	Sample Name:	W-161024-RA-10	W-161024-RA-18	W-161025-RA-30	W-161025-RA-25	W-161025-RA-21	W-161025-RA-22	W-161025-RA-31
	Sample Date:	10/24/2016	10/24/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016
	Cleanup Standard or MCL	West Bank						
	Unit							
Volatile Organic Compounds								
1,1,2-Trichloroethane	µg/L	1.0 U						
1,1-Dichloroethene	µg/L	1.0 U						
Acetone	µg/L	10 U						
Benzene	5	µg/L	1.0 U					
Carbon tetrachloride		µg/L	1.0 U					
Chloroform (Trichloromethane)		µg/L	1.0 U					
cis-1,2-Dichloroethene	70	µg/L	2.1	1.0 U	0.69 J	2.4	1.0 U	1.9
Ethylbenzene	700	µg/L	1.0 U					
Methylene chloride		µg/L	1.0 U					
Tetrachloroethene	5	µg/L	1.0 U					
Toluene	1000	µg/L	1.0 U					
Trichloroethene	5	µg/L	12	34	13.0	7.4	1.0 U	21
Vinyl chloride	2	µg/L	1.0 U					
Xylenes (total)	10,000	µg/L	1.0 U					

Table 2

**Groundwater Sampling Analytical Results - October 2016
Wausau Water Supply NPL Site
Wausau, Wisconsin**

	Location ID:	R4D	MW1A	MW1A FD	WSWD	C2S	C4S	C7S
	Sample Name:	W-161024-RA-19	W-161025-RA-26	W-161025-RA-27	W-161025-RA-33	W-161025-RA-35	W-161025-RA-23	W-161025-RA-34
	Sample Date:	10/24/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016
	Cleanup Standard or MCL	West Bank						
	Unit							
Volatile Organic Compounds								
1,1,2-Trichloroethane	µg/L	1.0 U						
1,1-Dichloroethene	µg/L	1.0 U						
Acetone	µg/L	10 U						
Benzene	5	µg/L	1.0 U					
Carbon tetrachloride		µg/L	1.0 U					
Chloroform (Trichloromethane)		µg/L	1.0 U	1.0 U	1.0 U	1.0 U	0.64 J	1.0 U
cis-1,2-Dichloroethene	70	µg/L	0.57 J	1.0 U	1.0 U	1.0 U	0.34 J	1.8
Ethylbenzene	700	µg/L	1.0 U					
Methylene chloride		µg/L	1.0 U					
Tetrachloroethene	5	µg/L	1.0 U					
Toluene	1000	µg/L	1.0 U					
Trichloroethene	5	µg/L	5.4	1.0 U	1.0 U	1.2	5.1	5.5
Vinyl chloride	2	µg/L	1.0 U					
Xylenes (total)	10,000	µg/L	1.0 U					

Table 2

**Groundwater Sampling Analytical Results - October 2016
Wausau Water Supply NPL Site
Wausau, Wisconsin**

	Location ID:	W52A	WSWS	CW6	EW1	CW3	MW10B	MW10A
	Sample Name:	W-161025-RA-29	W-161025-RA-32	W-161025-RA-20	W-161025-RA-28	W-161024-RA-17	W-161024-RA-01	W-161024-RA-02
	Sample Date:	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/24/2016	10/24/2016	10/24/2016
	Cleanup Standard or MCL	West Bank	West Bank	West Bank	West Bank	East Bank	East Bank	East Bank
	Unit							
Volatile Organic Compounds								
1,1,2-Trichloroethane	µg/L	1.0 U						
1,1-Dichloroethene	µg/L	1.0 U						
Acetone	µg/L	10 U						
Benzene	5 µg/L	1.0 U						
Carbon tetrachloride	µg/L	1.0 U						
Chloroform (Trichloromethane)	µg/L	1.0 U						
cis-1,2-Dichloroethene	70 µg/L	1.0 U	1.0 U	1.0 U	1.0 U	0.68 J	1.0 U	1.0 U
Ethylbenzene	700 µg/L	1.0 U						
Methylene chloride	µg/L	1.0 U						
Tetrachloroethene	5 µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.5	0.33 J	1.0 U
Toluene	1000 µg/L	1.0 U						
Trichloroethene	5 µg/L	1.0 U	1.0 U	3.3	1.0 U	0.82 J	1.0 U	1.0 U
Vinyl chloride	2 µg/L	1.0 U						
Xylenes (total)	10,000 µg/L	1.0 U						

Table 2

**Groundwater Sampling Analytical Results - October 2016
Wausau Water Supply NPL Site
Wausau, Wisconsin**

		Location ID:	E21	E21 FD	E22A	E24AR	E37A	WW4	WW6
		Sample Name:	W-161024-RA-08	W-161024-RA-09	W-161024-RA-03	W-161024-RA-04	W-161024-RA-15	W-161024-RA-05	W-161024-RA-06
		Sample Date:	10/24/2016						
		Cleanup Standard or MCL	East Bank						
		Unit							
Volatile Organic Compounds									
1,1,2-Trichloroethane		µg/L	1.0 U	1.0 U	5.0 U	6.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene		µg/L	1.0 U	1.0 U	5.0 U	6.0 U	1.0 U	1.0 U	1.0 U
Acetone		µg/L	10 U	10 U	50 U	60 U	10 U	10 U	10 U
Benzene	5	µg/L	1.0 U	1.0 U	5.0 U	6.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride		µg/L	1.0 U	1.0 U	5.0 U	6.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)		µg/L	1.0 U	1.0 U	5.0 U	6.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	µg/L	1.0 U	1.0 U	5.0 U	97	0.60 J	1.0 U	6.2
Ethylbenzene	700	µg/L	1.0 U	1.0 U	5.0 U	6.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride		µg/L	1.0 U	1.0 U	5.0 U	6.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	µg/L	1.0 U	1.0 U	120	42	0.88 J	1.0 U	1.0 U
Toluene	1000	µg/L	1.0 U	1.0 U	5.0 U	6.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	µg/L	1.0 U	1.0 U	3.0 J	5.8 J	0.27 J	1.0 U	0.53 J
Vinyl chloride	2	µg/L	1.0 U	1.0 U	5.0 U	7.3	1.0 U	1.0 U	1.3 J
Xylenes (total)	10,000	µg/L	1.0 U	1.0 U	5.0 U	6.0 U	1.0 U	1.0 U	1.0 U

Table 2

**Groundwater Sampling Analytical Results - October 2016
Wausau Water Supply NPL Site
Wausau, Wisconsin**

		Location ID:	WC3B	WC3B FD	WC5A
		Sample Name:	W-161024-RA-11	W-161024-RA-12	W-161024-RA-14
		Sample Date:	10/24/2016	10/24/2016	10/24/2016
	Cleanup Standard or MCL	Unit	East Bank	East Bank	East Bank
Volatile Organic Compounds					
		µg/L	1.0 U	1.0 U	1.0 U
		µg/L	1.0 U	1.0 U	1.0 U
		µg/L	10 U	10 U	10 U
	5	µg/L	1.0 U	1.0 U	1.0 U
		µg/L	1.0 U	1.0 U	1.0 U
		µg/L	1.0 U	1.0 U	1.0 U
	70	µg/L	1.0 U	1.0 U	15
	700	µg/L	1.0 U	1.0 U	1.0 U
		µg/L	1.0 U	1.0 U	1.0 U
	5	µg/L	0.55 J	1.0 U	2.9
	1000	µg/L	1.0 U	1.0 U	1.0 U
	5	µg/L	1.0 U	1.0 U	1.9
	2	µg/L	1.0 U	1.0 U	6.3
	10,000	µg/L	1.0 U	1.0 U	1.0 U

Notes:

U - Not detected at the associated reporting limit

J - Estimated concentration

Shaded cells indicate concentration exceeded the Site Cleanup Standard

FD - Field duplicate

- shaded cells indicate concentration exceeds MCL

Table 3

**Laboratory Results Summary
October 2017 Groundwater Sampling Event
Wausau Water Supply NPL Site
Wausau, Wisconsin**

Location ID:		C3S	C7S	R1D	R1D FD	C2S	C4S
Sample Name:		W-171002-RA-11	W-171003-RA-30	W-171003-RA-26	W-171003-RA-27	W-171003-RA-17	W-171002-RA-10
Sample Date:		10/02/2017	10/03/2017	10/03/2017	10/03/2017	10/03/2017	10/02/2017
		West Bank					
Parameters	Unit						
Volatile Organic Compounds	EPA MCL						
1,1,2-Trichloroethane	µg/L	1.0 U					
1,1-Dichloroethene	µg/L	1.0 U					
Acetone	µg/L	5.0 U					
Benzene	5 µg/L	0.50 U					
Carbon tetrachloride	5 µg/L	150	1.0 U				
Chloroform (Trichloromethane)	µg/L	66	2.0 U				
cis-1,2-Dichloroethene	70 µg/L	1.0 U	1.0 U	1.0 U	1.0 U	0.59 J	1.0 U
Ethylbenzene	700 µg/L	0.50 U					
Methylene chloride	µg/L	5.0 U					
Tetrachloroethene	5 µg/L	0.53 J	1.0 U				
Toluene	1,000 µg/L	0.50 U					
Trichloroethene	5 µg/L	3.1	10	0.50 U	0.50 U	5.8	3.7
Vinyl chloride	2 µg/L	0.50 U					
Xylenes (total)	10,000 µg/L	1.0 U					

**Laboratory Results Summary
October 2017 Groundwater Sampling Event
Wausau Water Supply NPL Site
Wausau, Wisconsin**

Location ID:		MW1A	WSWD	R2D	R3D	R4D	W52
Sample Name:		W-171003-RA-20	W-171003-RA-28	W-171003-RA-23	W-171003-RA-29	W-171003-RA-16	W-171003-RA-19
Sample Date:		10/03/2017	10/03/2017	10/03/2017	10/03/2017	10/03/2017	10/03/2017
		West Bank					
Parameters	Unit						
Volatile Organic Compounds	EPA MCL						
1,1,2-Trichloroethane	µg/L	1.0 U					
1,1-Dichloroethene	µg/L	1.0 U					
Acetone	µg/L	5.0 U					
Benzene	5 µg/L	0.50 U					
Carbon tetrachloride	5 µg/L	1.0 U					
Chloroform (Trichloromethane)	µg/L	2.0 U					
cis-1,2-Dichloroethene	70 µg/L	1.0 U	1.0 U	1.7	1.0 U	0.74 J	2.2
Ethylbenzene	700 µg/L	0.50 U					
Methylene chloride	µg/L	5.0 U					
Tetrachloroethene	5 µg/L	1.0 U					
Toluene	1,000 µg/L	0.50 U					
Trichloroethene	5 µg/L	0.50 U	1.5	15	2.2	1.5	14
Vinyl chloride	2 µg/L	0.50 U					
Xylenes (total)	10,000 µg/L	1.0 U					

**Laboratory Results Summary
October 2017 Groundwater Sampling Event
Wausau Water Supply NPL Site
Wausau, Wisconsin**

Location ID:		W53A	W54	W55	W55 FD	W56	CW6
Sample Name:		W-171002-RA-12	W-171002-RA-13	W-171003-RA-21	W-171003-RA-22	W-171003-RA-25	W-171003-RA-15
Sample Date:		10/02/2017	10/02/2017	10/03/2017	10/03/2017	10/03/2017	10/03/2017
		West Bank					
Parameters	Unit						
Volatile Organic Compounds	EPA MCL						
1,1,2-Trichloroethane	µg/L	1.0 U					
1,1-Dichloroethene	µg/L	1.0 U					
Acetone	µg/L	5.0 U					
Benzene	5 µg/L	0.50 U					
Carbon tetrachloride	5 µg/L	1.0 U					
Chloroform (Trichloromethane)	µg/L	2.0 U					
cis-1,2-Dichloroethene	70 µg/L	1.0 U	1.4	5.6	5.7	1.0 U	1.0 U
Ethylbenzene	700 µg/L	0.50 U					
Methylene chloride	µg/L	5.0 U					
Tetrachloroethene	5 µg/L	1.0 U					
Toluene	1,000 µg/L	0.50 U					
Trichloroethene	5 µg/L	74	6.6	7.3	7.3	0.50 U	3.0
Vinyl chloride	2 µg/L	0.50 U					
Xylenes (total)	10,000 µg/L	1.0 U					

Table 3

**Laboratory Results Summary
October 2017 Groundwater Sampling Event
Wausau Water Supply NPL Site
Wausau, Wisconsin**

Location ID:		EW1	E21	E22A	E24AR	E37A	MW10A
Sample Name:		W-171003-RA-18	W-171002-RA-05	W-171002-RA-08	W-171003-RA-31	W-171003-RA-14	W-171002-RA-09
Sample Date:		10/03/2017	10/02/2017	10/02/2017	10/03/2017	10/03/2017	10/02/2017
		West Bank	East Bank				
Parameters	Unit						
Volatile Organic Compounds	EPA MCL						
1,1,2-Trichloroethane	µg/L	1.0 U					
1,1-Dichloroethene	µg/L	1.0 U	1.0 U	1.0 U	0.55 J	1.0 U	1.0 U
Acetone	µg/L	5.0 U					
Benzene	5 µg/L	0.50 U					
Carbon tetrachloride	5 µg/L	1.0 U					
Chloroform (Trichloromethane)	µg/L	2.0 U					
cis-1,2-Dichloroethene	70 µg/L	1.0 U	1.0 U	1.0 U	53	1.8	1.0 U
Ethylbenzene	700 µg/L	0.50 U					
Methylene chloride	µg/L	5.0 U					
Tetrachloroethene	5 µg/L	1.0 U	1.0 U	21	12	1.0 U	1.0 U
Toluene	1,000 µg/L	0.50 U					
Trichloroethene	5 µg/L	0.50 U	0.50 U	0.85	4.6	0.50 U	0.50 U
Vinyl chloride	2 µg/L	0.50 U	0.50 U	0.50 U	7.9	1.6	0.50 U
Xylenes (total)	10,000 µg/L	1.0 U					

**Laboratory Results Summary
October 2017 Groundwater Sampling Event
Wausau Water Supply NPL Site
Wausau, Wisconsin**

Location ID:		WC3B	WC5A	WC5A FD	WW4	WW6
Sample Name:		W-171002-RA-03	W-171002-RA-01	W-171002-RA-02	W-171002-RA-07	W-171002-RA-06
Sample Date:		10/02/2017	10/02/2017	10/02/2017	10/02/2017	10/02/2017
		East Bank				
Parameters		Unit				
Volatile Organic Compounds	EPA MCL					
1,1,2-Trichloroethane		µg/L	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene		µg/L	1.0 U	1.0 U	1.0 U	1.0 U
Acetone		µg/L	5.0 U	5.0 U	5.0 U	5.0 U
Benzene	5	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
Carbon tetrachloride	5	µg/L	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)		µg/L	2.0 U	2.0 U	2.0 U	2.0 U
cis-1,2-Dichloroethene	70	µg/L	1.0 U	90	95	7.9
Ethylbenzene	700	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
Methylene chloride		µg/L	5.0 U	5.0 U	5.0 U	5.0 U
Tetrachloroethene	5	µg/L	13	6.7	7.6	1.0 U
Toluene	1,000	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
Trichloroethene	5	µg/L	0.40 J	2	2.1	0.50 U
Vinyl chloride	2	µg/L	0.50 U	16	17	0.28 J
Xylenes (total)	10,000	µg/L	1.0 U	1.0 U	1.0 U	1.0 U

Notes:

U - Not detected at the associated reporting limit

J - Estimated value below the reporting limit, but above the method detection limit

The method detection limit for vinyl chloride is 0.20 ug/L

Shaded cells indicate concentration exceeds the EPA MCL for drinking water

**West Bank Shallow Aquifer Laboratory Results
Wausau Water Supply NPL Site
Wausau, Wisconsin**

West Bank	Date	Water Table Depth (ft bgs)	Sample Depth (ft bgs)	Units	Trichloroethene	cis-1,2-Dichloroethene	Vinyl chloride	Carbon tetrachloride	Chloroform
W1	3/8/2017	33	33-35	ug/L	0.33 U	0.30 U	0.45 U	0.35 U	0.31 U
W2	3/9/2017	30	31-35	ug/L	1.0	0.30 U	0.45 U	0.35 U	0.31 U
W3	3/9/2017	34	34-38	ug/L	0.33 U/0.33 U	0.30 U/0.30 U	0.45 U/0.45 U	0.35 U/0.35 U	0.31 U/0.31 U
W4	3/9/2017	23	23-25	ug/L	0.33 U	0.30 U	0.45 U	0.35 U	2.1
W5	3/9/2017	9	10-12	ug/L	0.33 U	0.30 U	0.45 U	0.35 U	0.31 U
W6	3/9/2017	9.5	10-12	ug/L	0.33 U	0.30 U	0.45 U	0.35 U	0.31 U
W7	3/9/2017	28	29-32	ug/L	0.33 U	0.30 U	0.45 U	0.35 U	0.31 U
EPA MCL				ug/L	5	70	2	5	-

Notes:

U - not detected at the associated method detection limit

Attachment 1

Contours

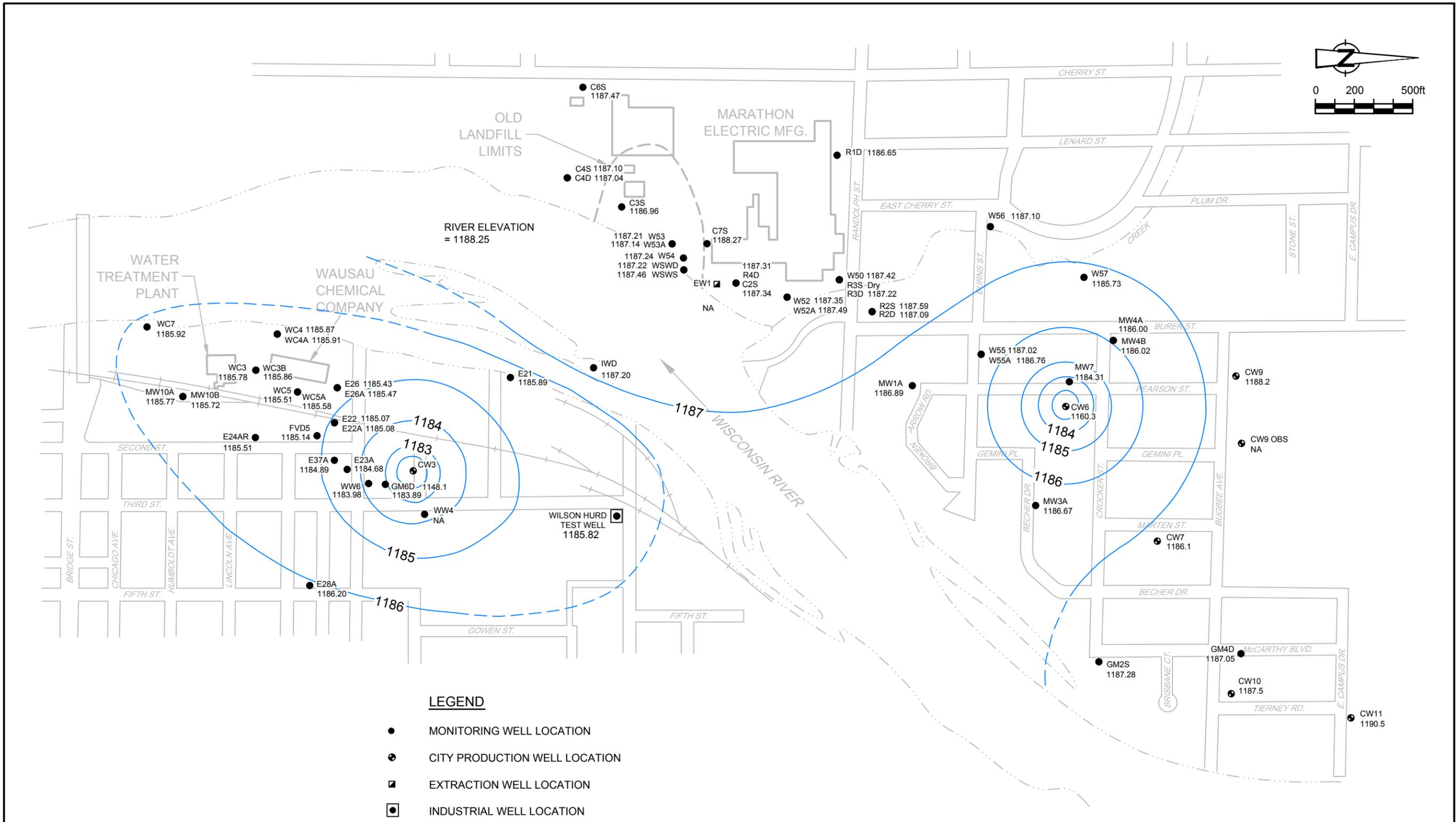


figure 2.1
 GROUNDWATER ELEVATIONS
 NOVEMBER 11, 12, 2013
 WAUSAU WATER SUPPLY NPL SITE
 Wausau, Wisconsin



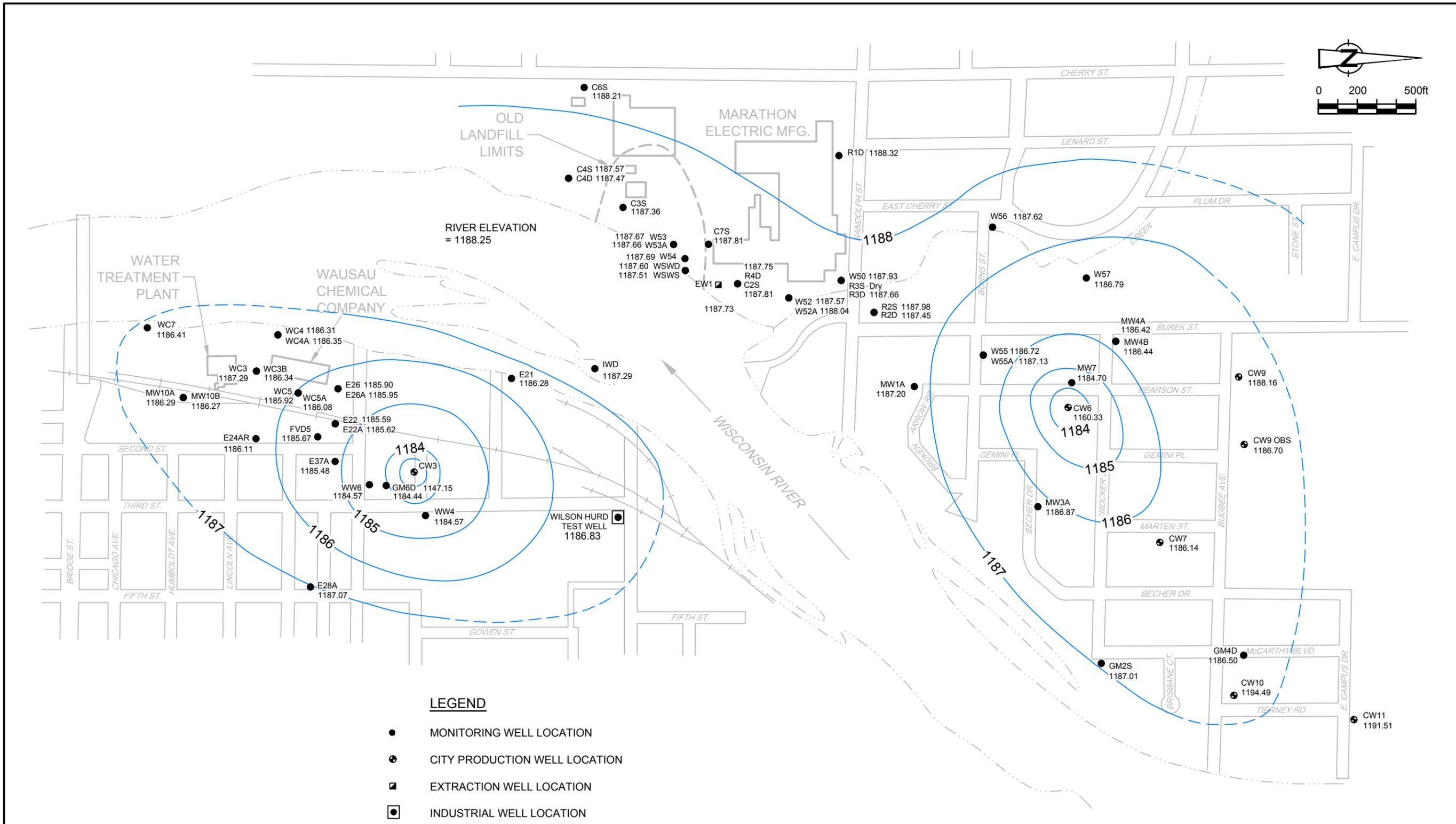
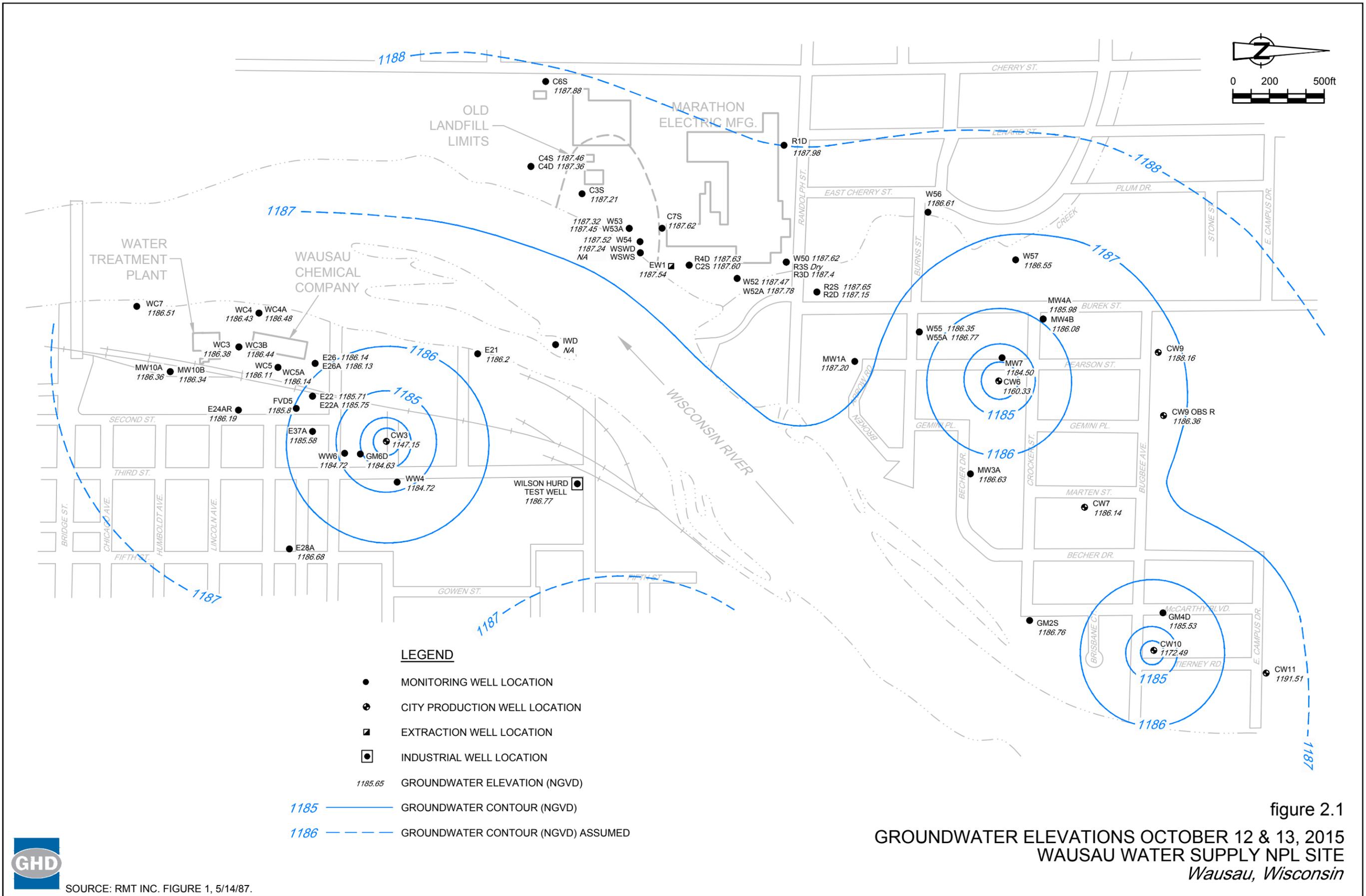


figure 2.1
 GROUNDWATER ELEVATIONS
 NOVEMBER 3, 4, 2014
 WAUSAU WATER SUPPLY NPL SITE
 Wausau, Wisconsin



SOURCE: RMT INC. FIGURE 1, 5/14/87.

03978-00(034)GN-WA002 FEB 2/2015

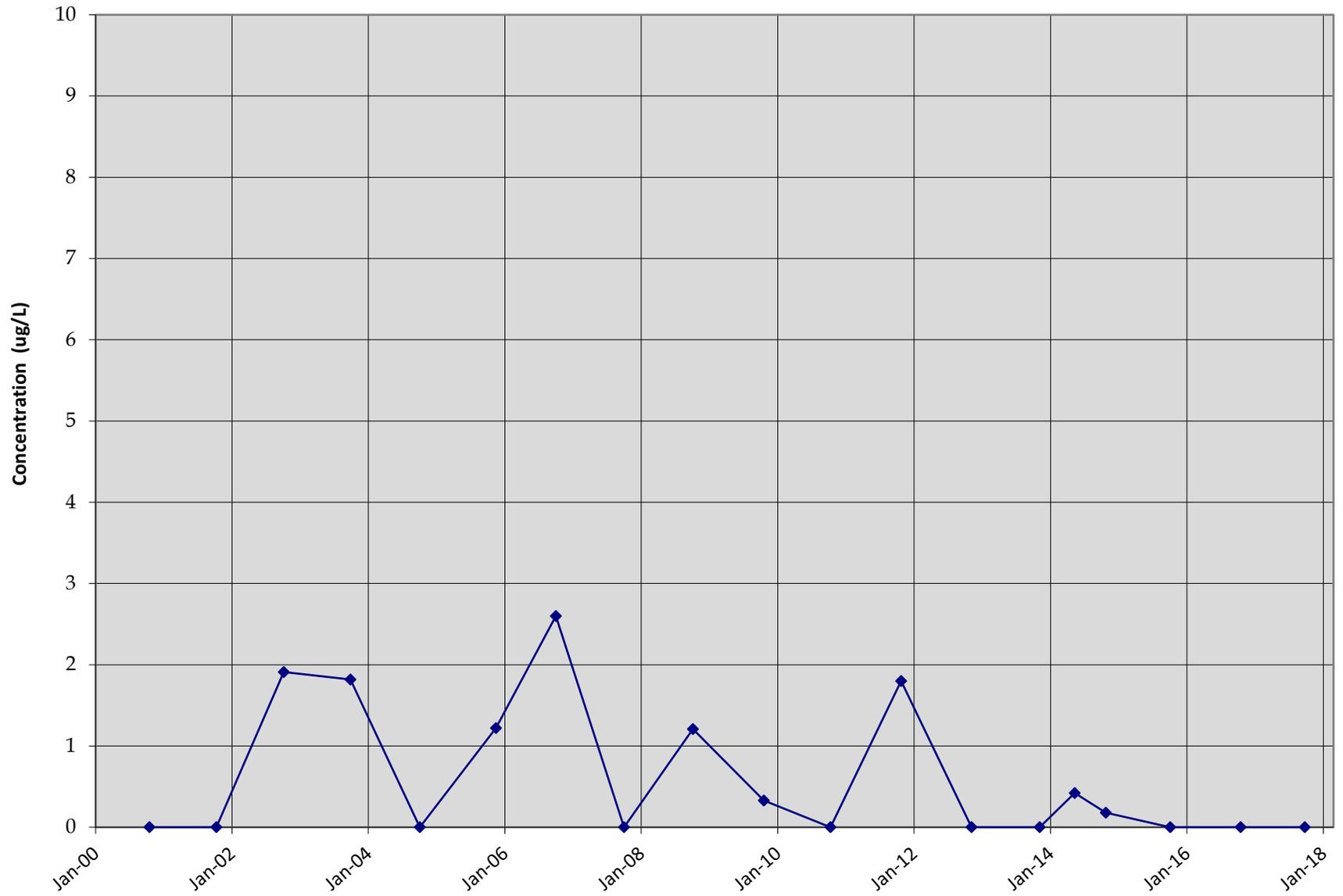


SOURCE: RMT INC. FIGURE 1, 5/14/87.

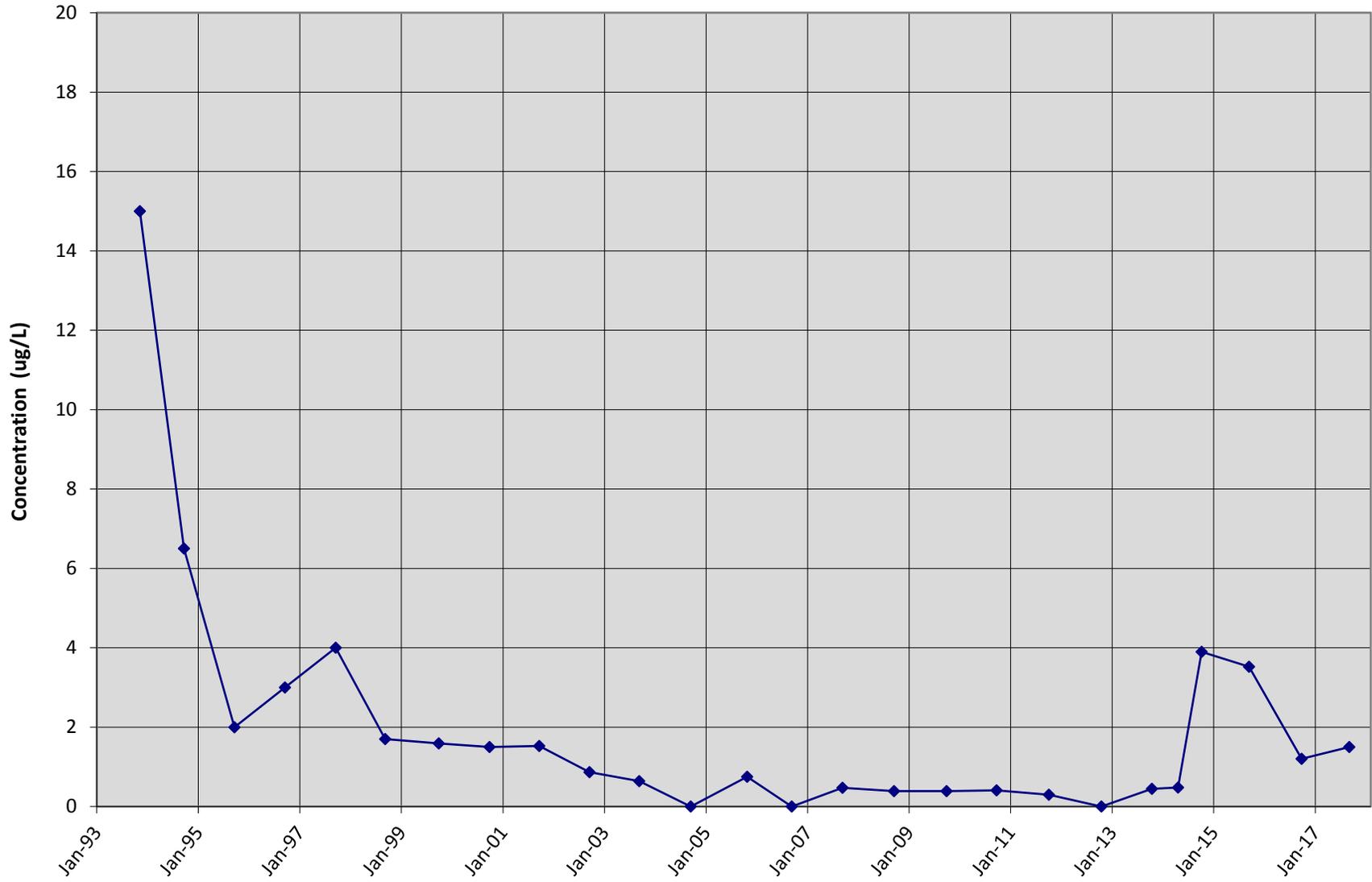
Attachment 2

Graphs

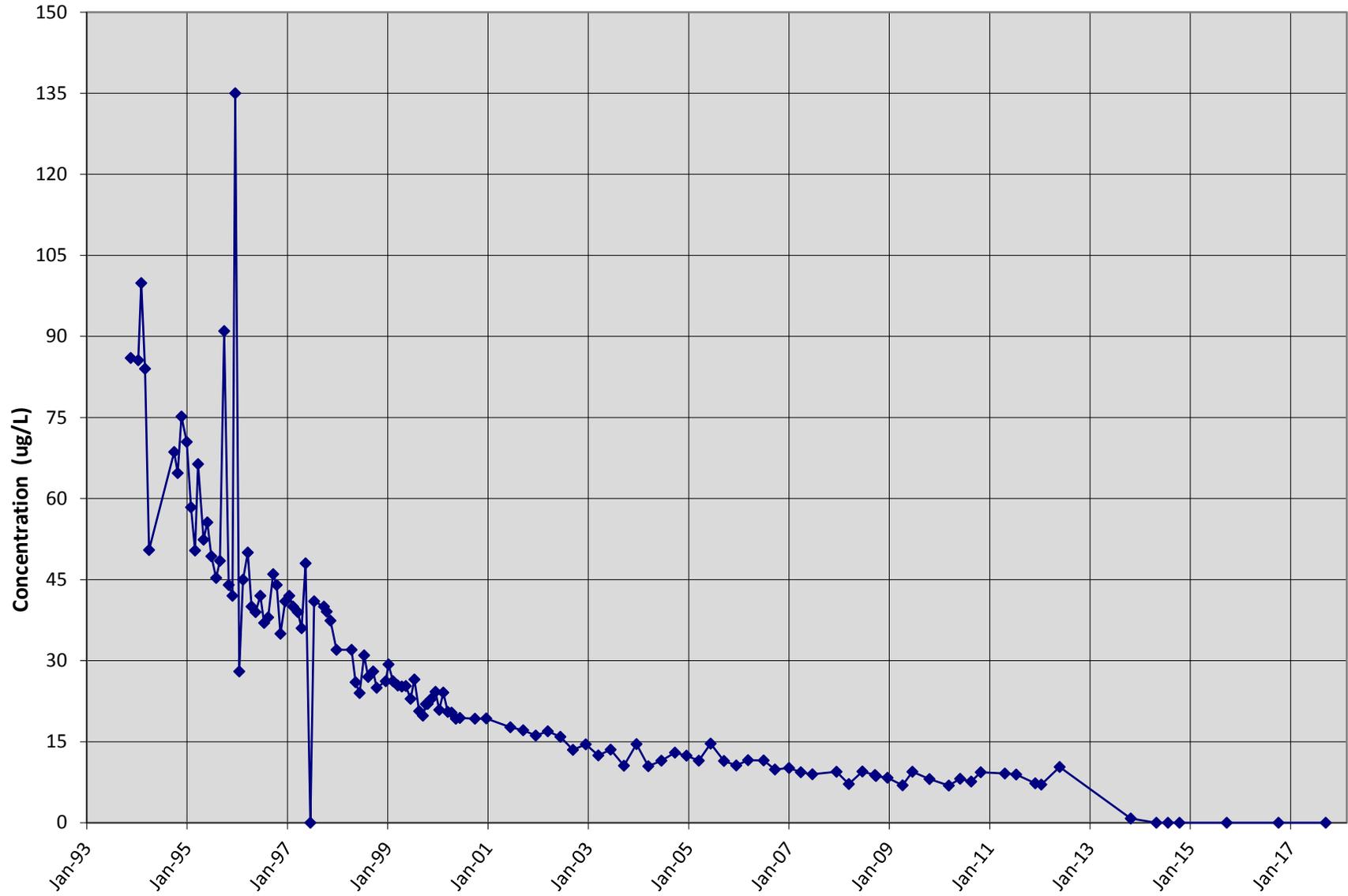
MW1A TCVOC



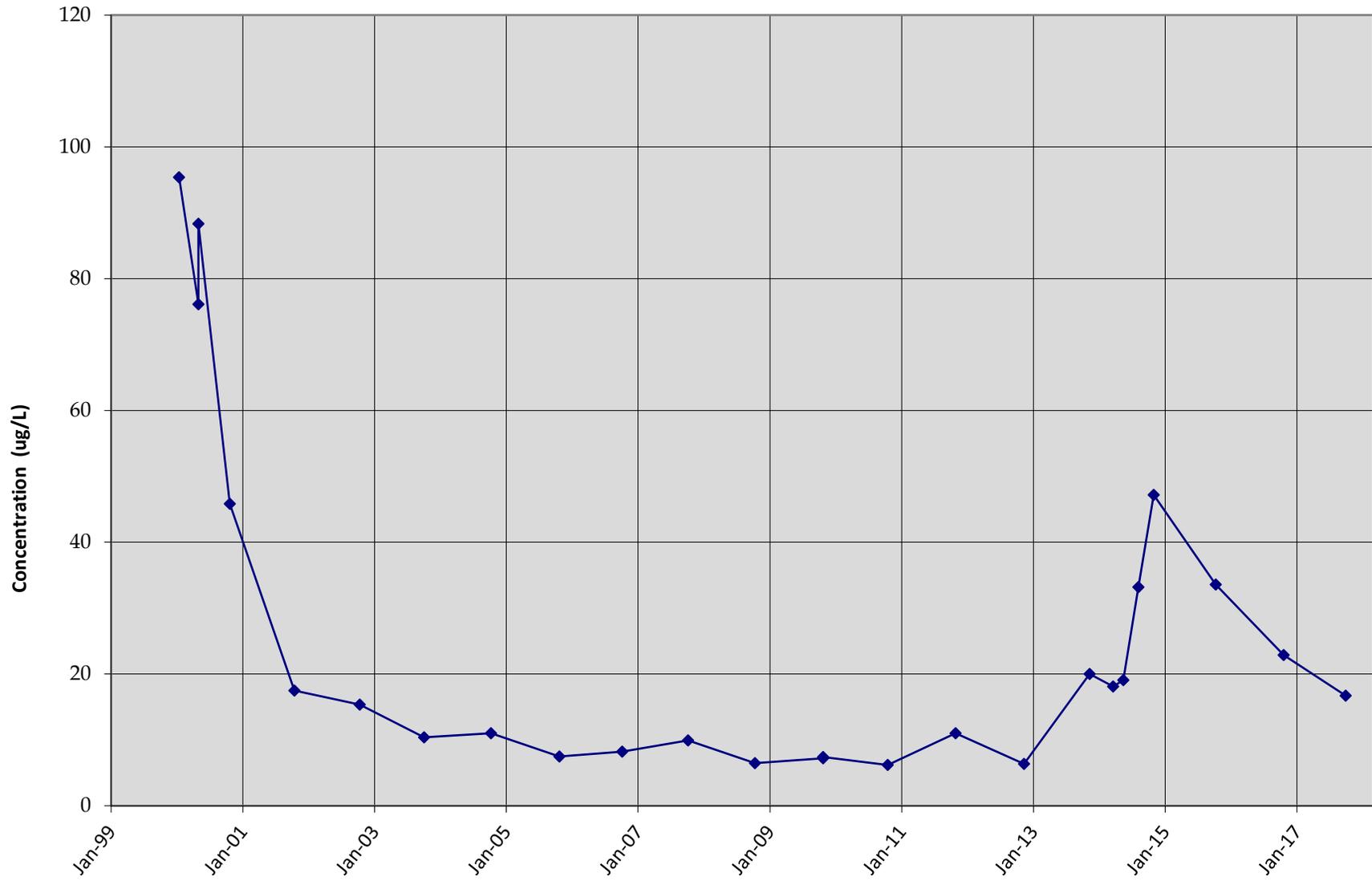
WSWD TCVOC



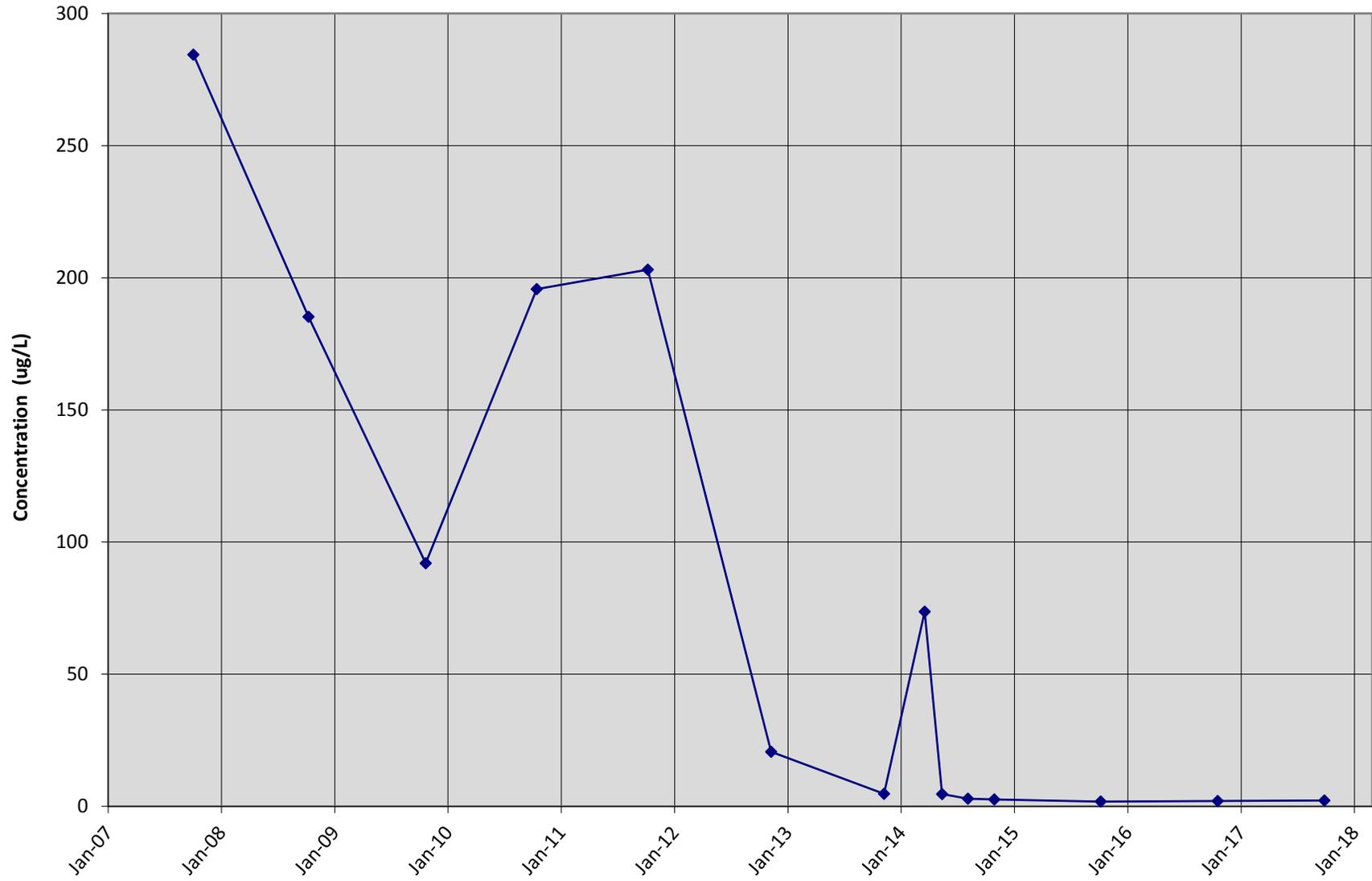
EW1 TCVOC



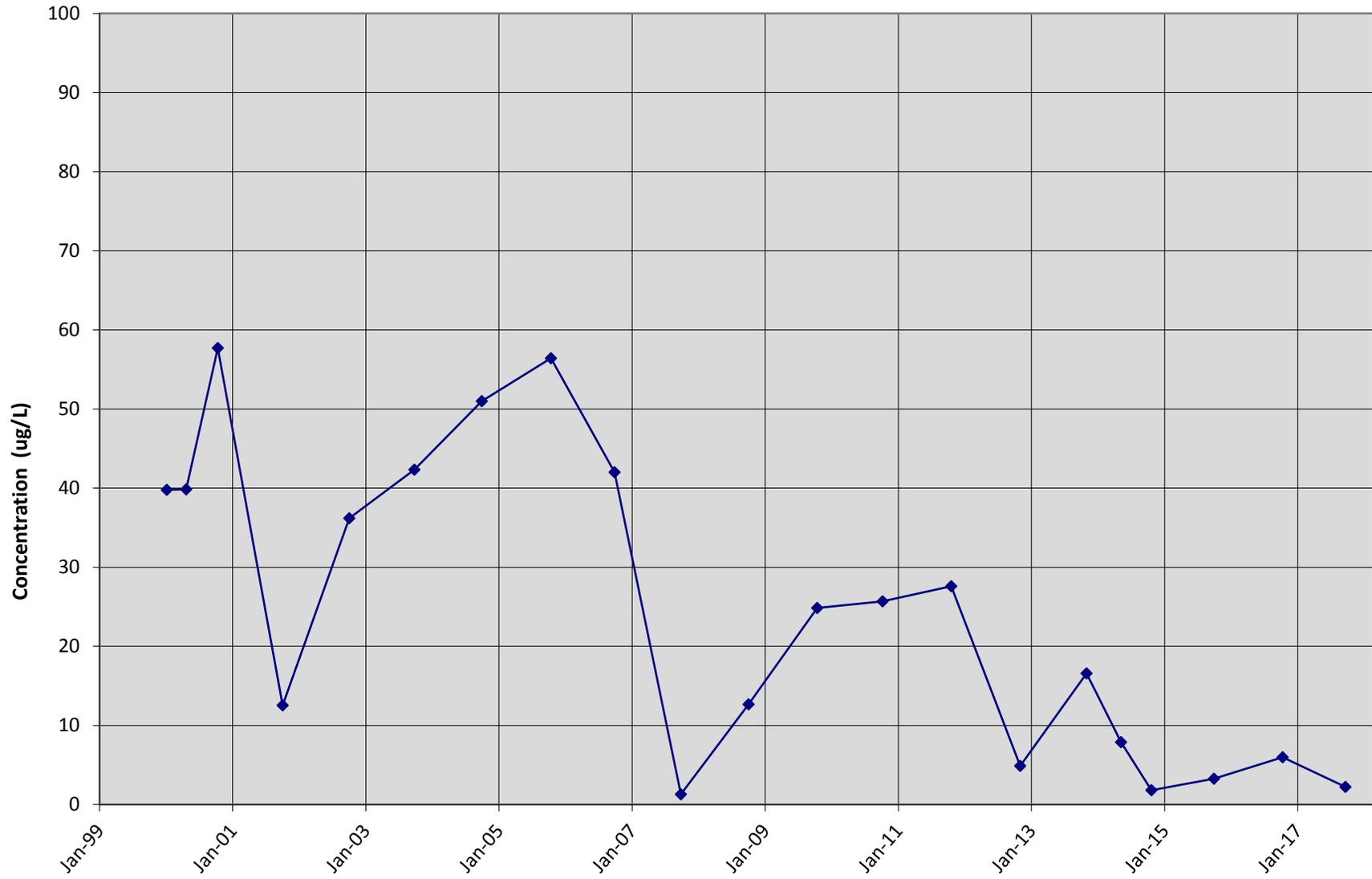
R2D TCVOC



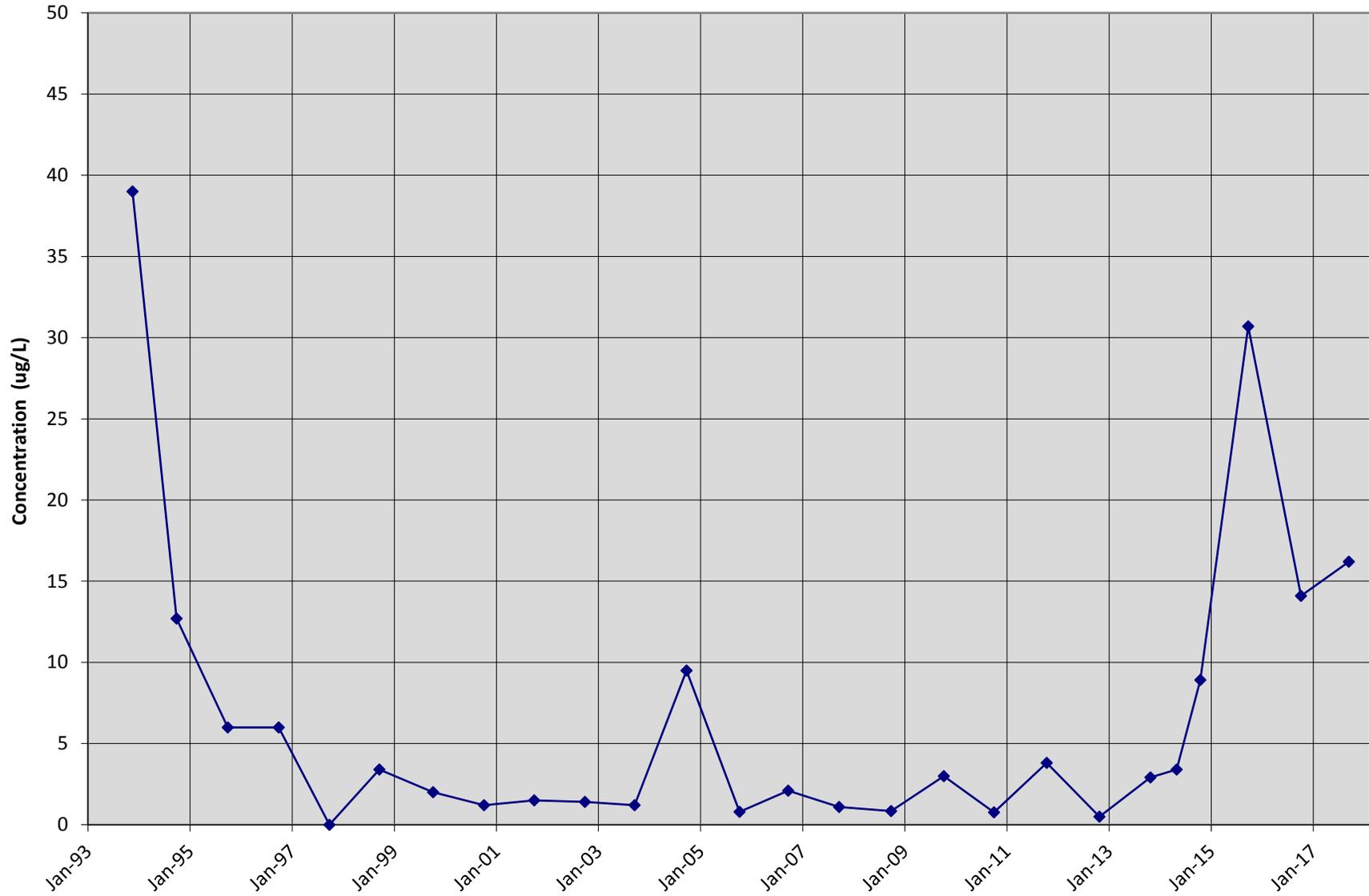
R3D TCVOC (Recent)



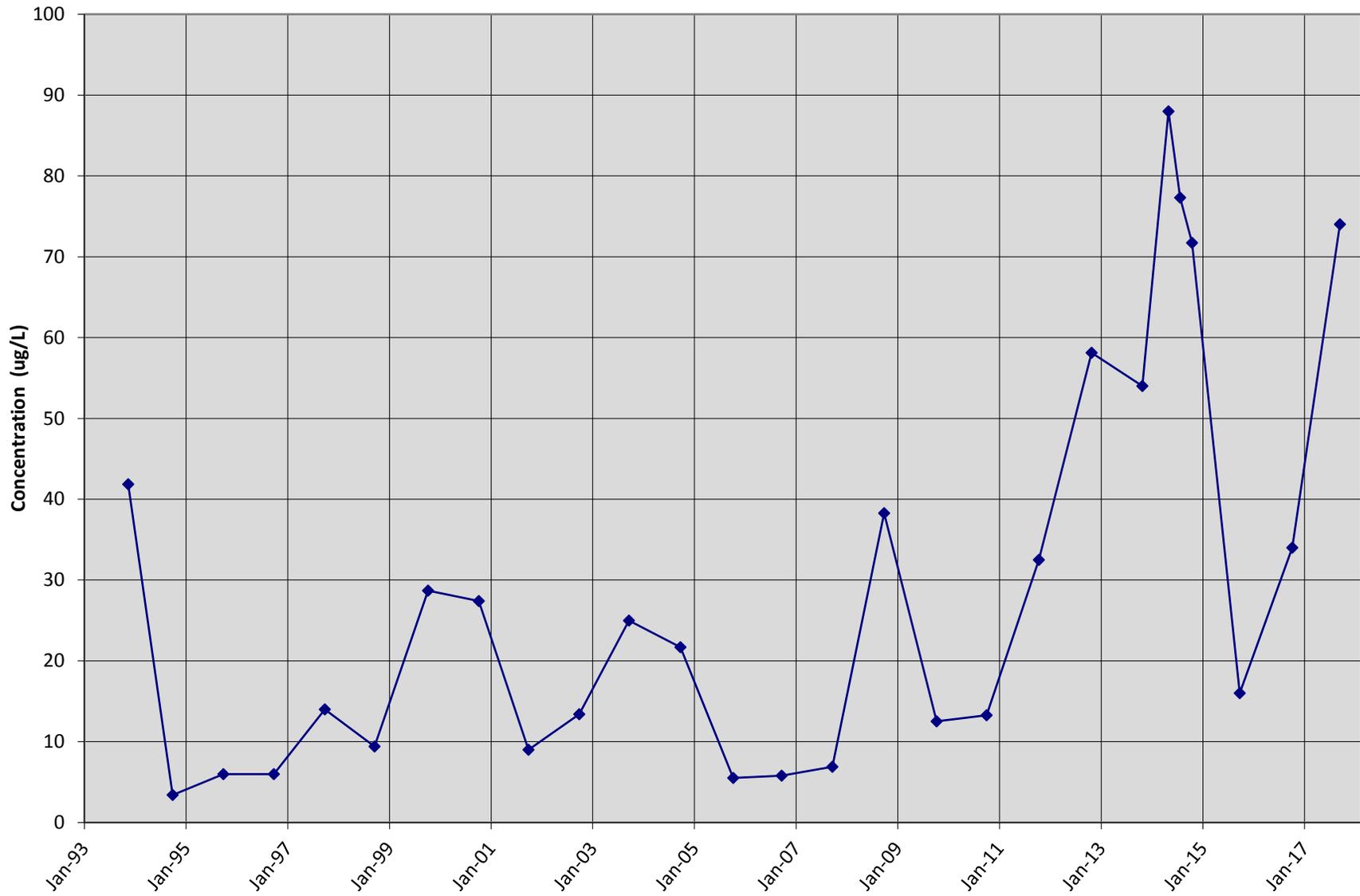
R4D TCVOC



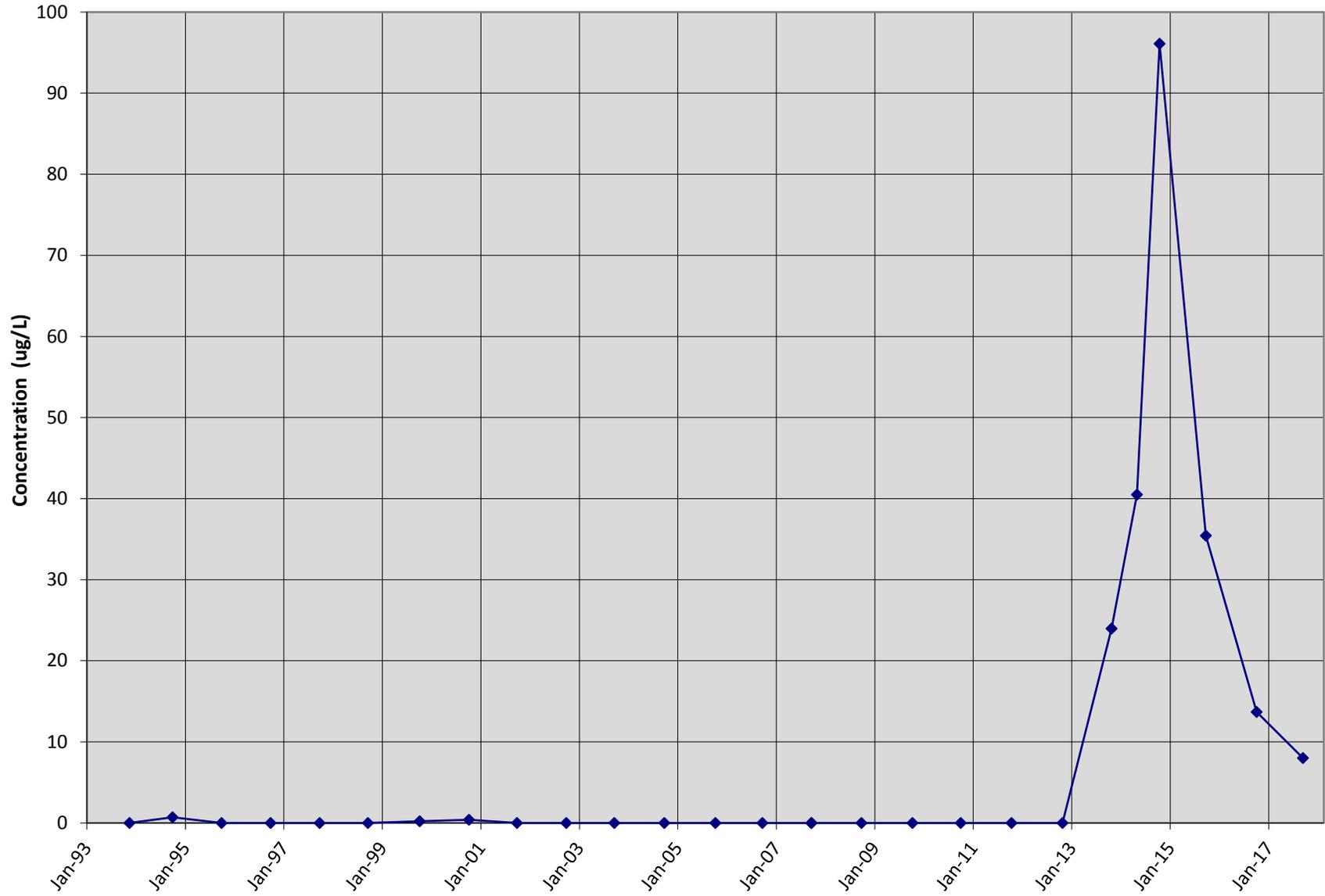
W52 TCVOC



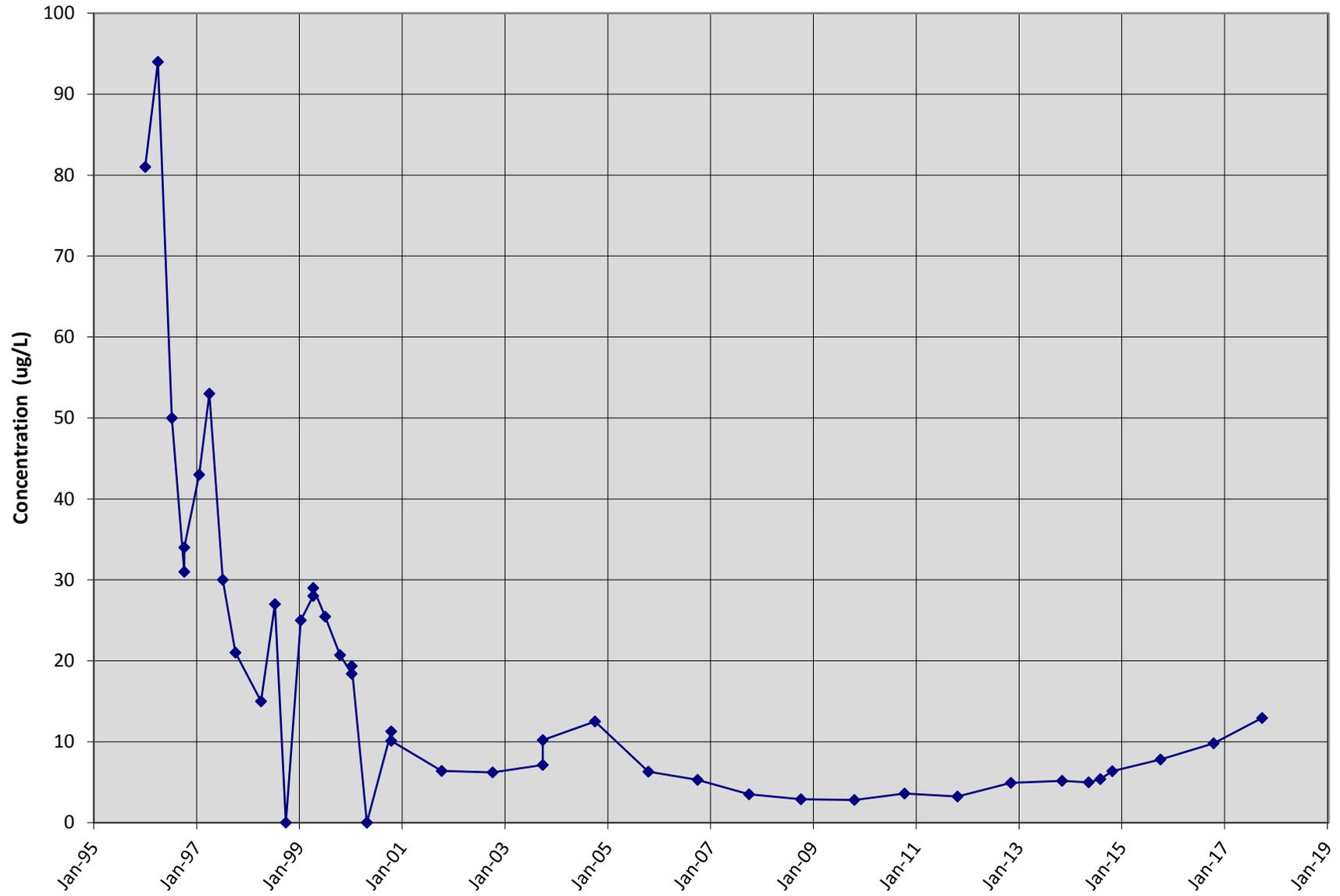
W53A TCVOC



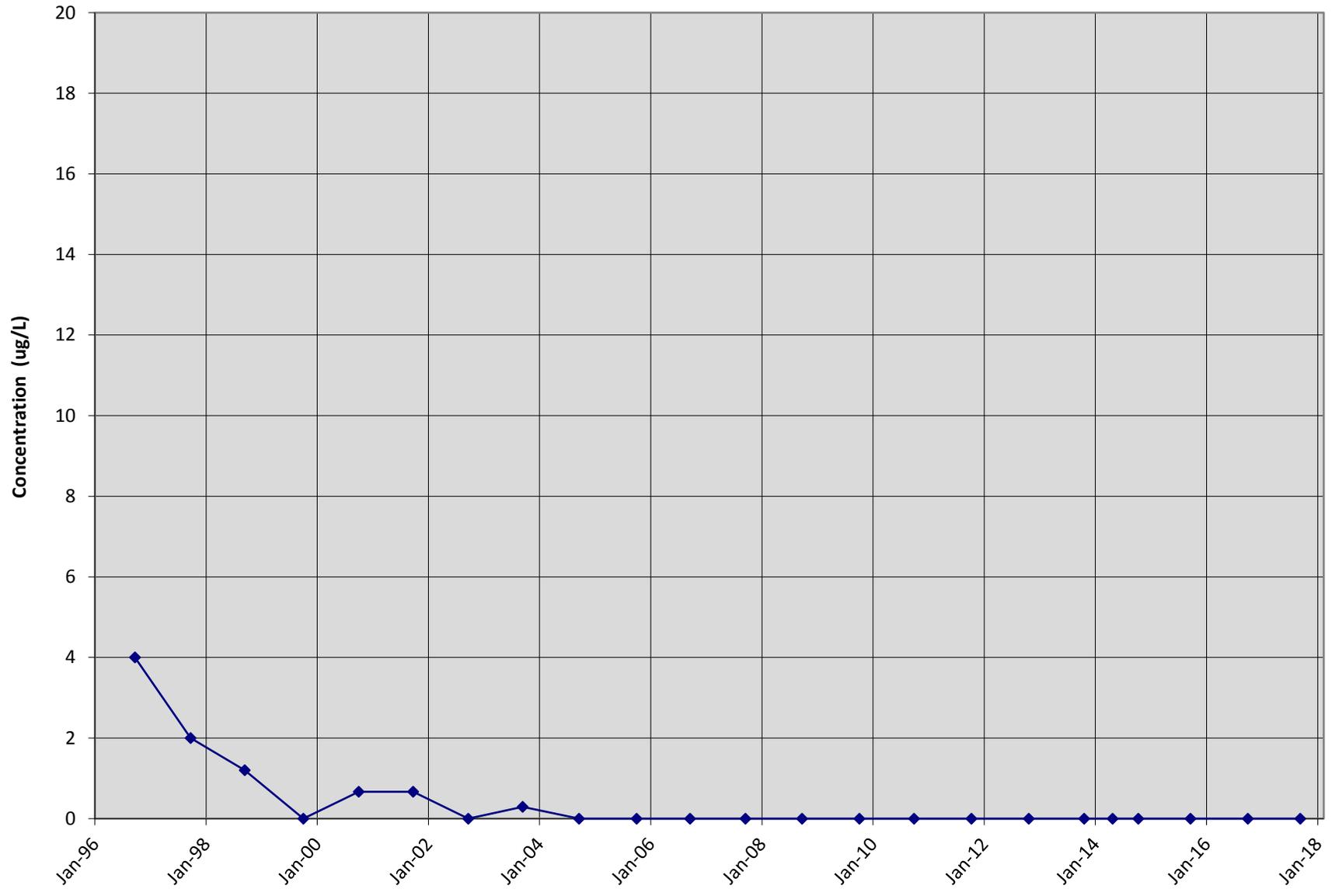
W54 TCVOC



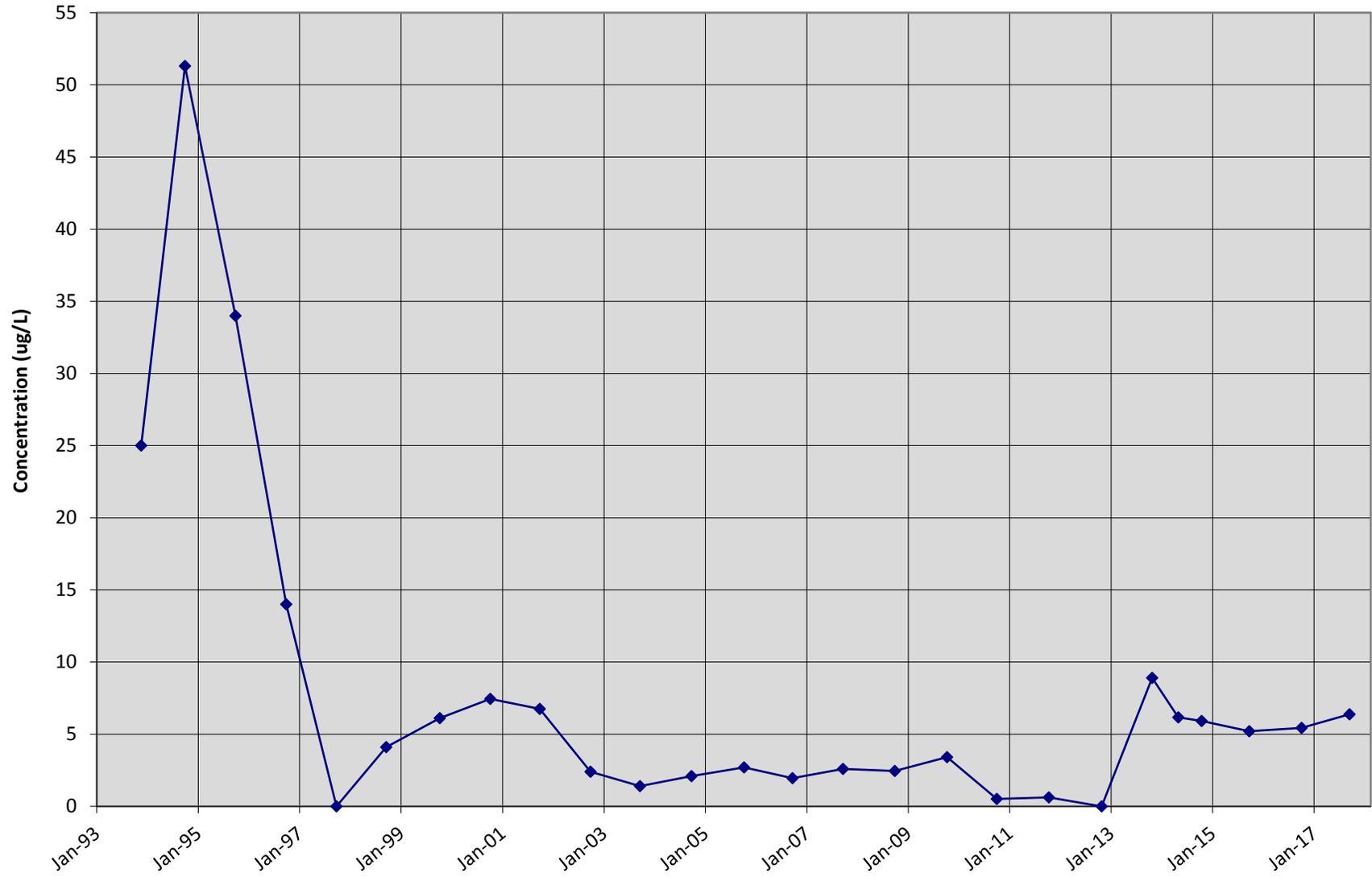
W55 TCVOC



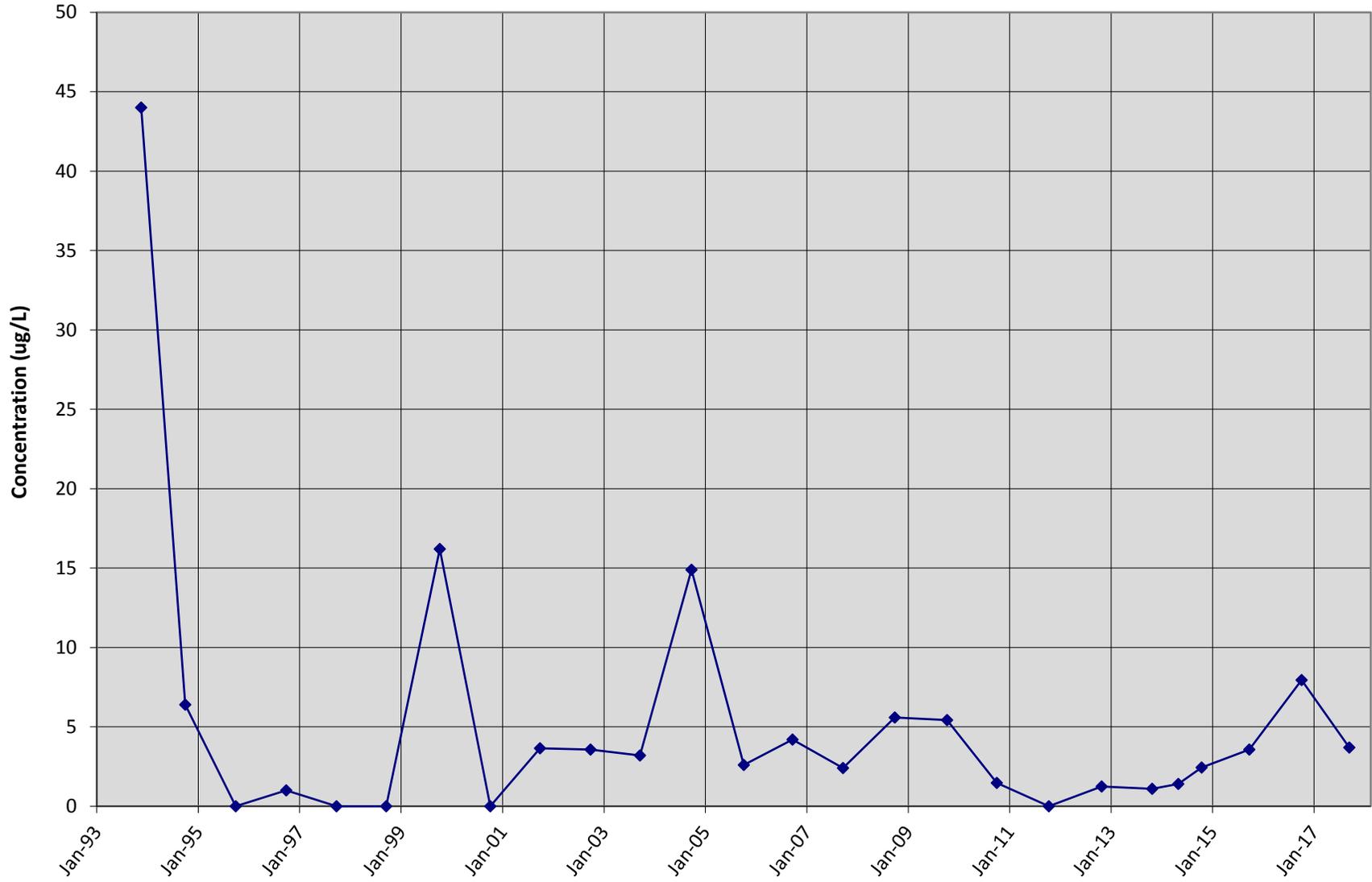
W56 TCVOC



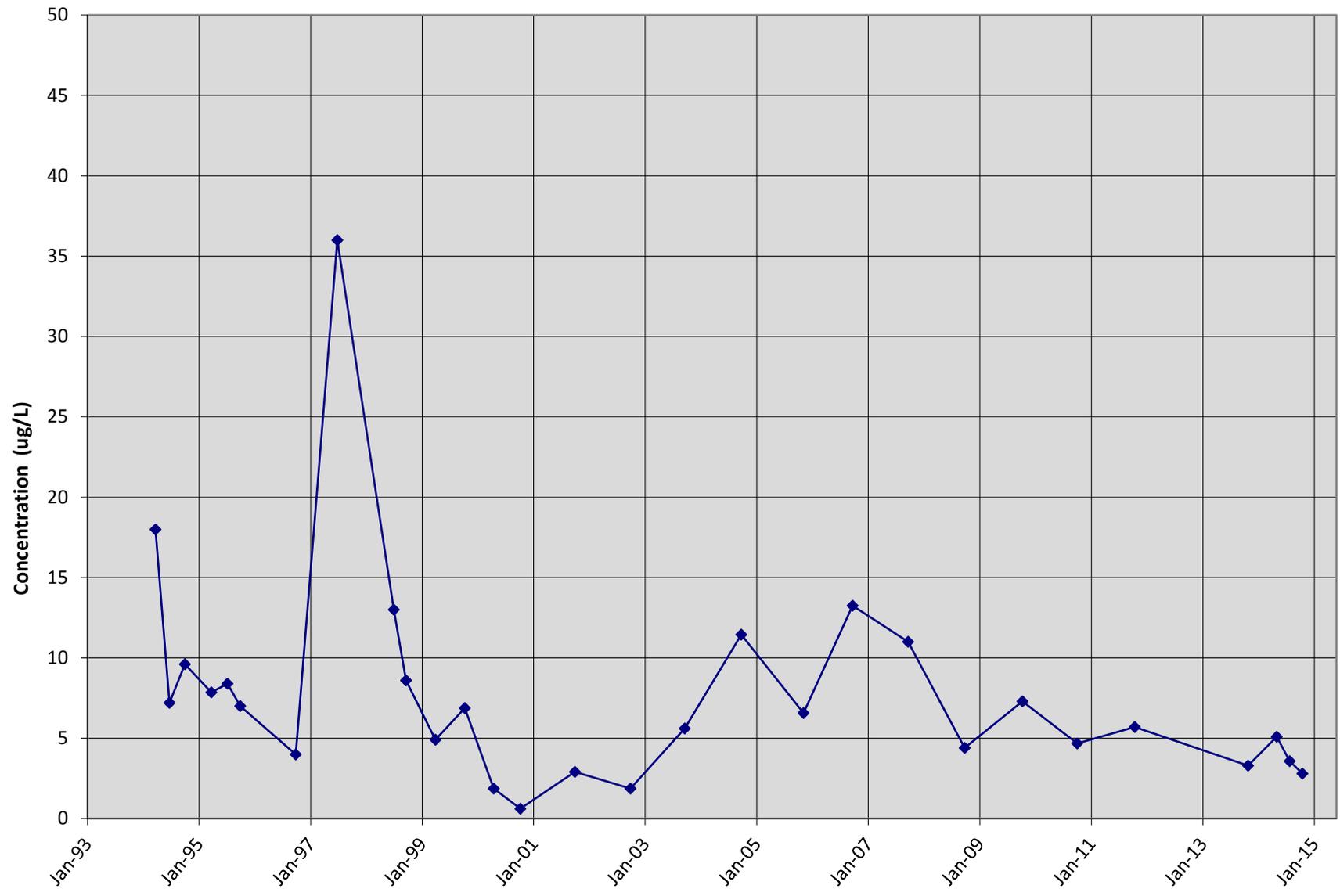
C2S TCVOC



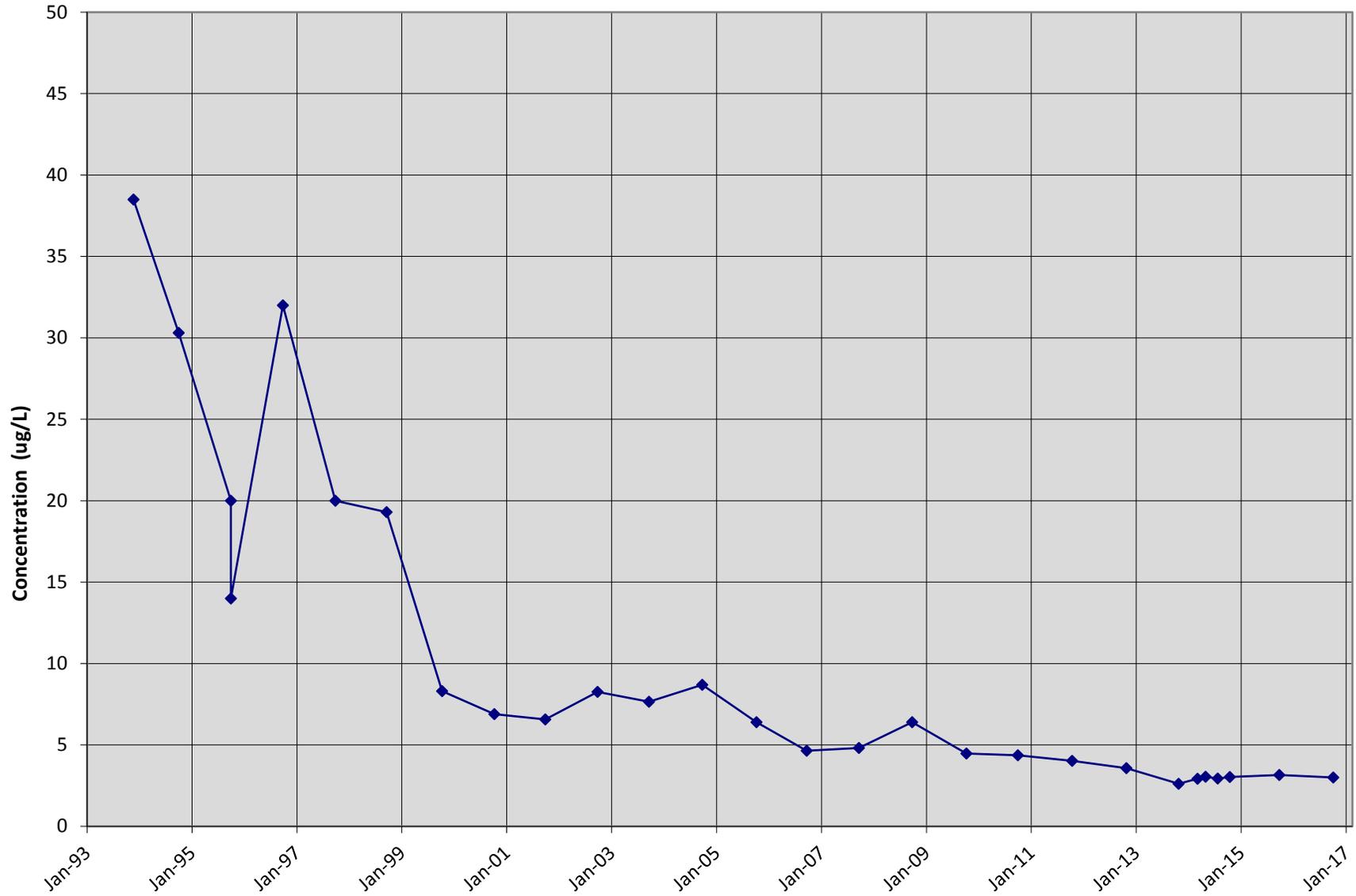
C4S TCVOC



IWD TCVOC



CW3 TCVOC



CW6 TCVOC

